Traffic Impact Study

Church of the Resurrection

City of Alexandria, Virginia

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EXECUTIVE SUMMARY

This report presents the findings of a Traffic Impact Study (TIS) conducted for the proposed redevelopment at 2280 N Beauregard Street. The site is currently occupied by the Church of the Resurrection.

Site Location and Study Area

The site is located in the City of Alexandria, Virginia, and is bounded by Fillmore Avenue to the north, an existing retirement community to the east and south, and N Beauregard Street to the west. The site is within the Beauregard Small Area Plan boundary.

Description of Proposed Development

Under the proposed plan, the existing 13,800 square foot church will be replaced with a building with 113 affordable dwelling units (ADUs) and an additional building that will replace existing church. A total of 112 parking spaces will be provided for the church and dwelling units.

Vehicular access will be provided via one (1) driveway located off of Fillmore Avenue.

Principal Findings, Conclusions, and Recommendations

This report presents the findings of a Traffic Impact Study (TIS) conducted for the proposed redevelopment of the Church of the Resurrection site in Alexandria, Virginia. The analysis presented in this report supports the following major conclusions:

- The nearest Metro station is the Van Dorn Street Metro station is located approximately 2.65 miles south of the site.
- The study area is served by ten Metrobus lines and two DASH lines with many bus stops located within a half mile of the site. There are two existing bus stops adjacent the site.
- The overall pedestrian network surrounding the project site is generally well established, with sidewalks on both sides of nearly all roadway segments and crosswalks at all signalized intersections and some minor street approaches.
- Off-street bicycle facilities and bike lanes are provided north of site along South Walter Reed Drive (North Beauregard Street becomes South Walter Reed Drive north of King Street). These bike facilities connect to the Washington & Old Dominion Trail and Four Mile Run northeast of the site. On-street shared lane markings are currently placed on North Beauregard Street at the Fillmore Avenue intersection, according to the Alexandria existing bicycle facilities map.
- For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of D or better for each lane group at the intersections. The capacity analysis results indicate that all intersections and movements operate at acceptable LOS under existing conditions, with the exception of the following:
    - Intersection 1: N Beauregard Street and Seminary Road
        - Eastbound Left, AM and PM Peak Hour
        - Eastbound Right, PM Peak Hour
        - Westbound Left, AM and PM Peak Hour
        - Westbound Thru/Right, AM Peak Hour

        - Northbound Left, PM Peak Hour
        - Southbound Left, AM Peak Hour
    - Intersection 2: N Beauregard Street and Fillmore Avenue
        - Eastbound Left, AM and Sunday Peak Hour
        - Westbound Left, PM Peak Hour
        - Northbound Left/Thru, AM Peak Hour
        - Northbound Right, AM Peak Hour
        - Southbound Left/Thru, AM and PM Peak Hour
        - Southbound Right, AM and PM Peak Hour
    - Intersection 3: N Beauregard Street and Braddock Road
        - Eastbound Left, AM, PM, and Sunday Peak Hour
        - Westbound Left, AM Peak Hour
        - Northbound Left, AM and PM Peak Hour
        - Northbound Left/Thru, AM and PM Peak Hour
        - Northbound Right, AM and PM Peak Hour
        - Southbound Left, AM and PM Peak Hour
        - Southbound Thru/Right, AM and PM Peak Hour
- The proposed development of the Church of the Resurrection site is anticipated to be completed in 2021. The future without development traffic volumes were projected by increasing the existing traffic volumes to the build-out year using an inherent growth rate of 0.5 percent per year at the study area intersections and by adding forecasted traffic volumes for three pipeline developments in the vicinity of the site.

- Under future (2021) without development conditions, the capacity analysis results indicate that all intersections and movements operate at acceptable LOS under existing conditions, with the exception of the:
    - Intersection 1: N Beauregard Street and Seminary Road
        - Eastbound Left, AM and PM Peak Hour
        - Eastbound Right, PM Peak Hour
        - Westbound Left, AM and PM Peak Hour
        - Northbound Left, PM Peak Hour
        - Southbound Left, AM Peak Hour
    - Intersection 2: N Beauregard Street and Fillmore Avenue
        - Eastbound Left, AM and Sunday Peak Hour
        - Westbound Left, AM and PM Peak Hour

        - Southbound Left/Thru, AM and PM Peak Hour
        - Southbound Right, PM Peak Hour
    - Intersection 3: N Beauregard Street and Braddock Road
        - Eastbound Left, AM, PM, and Sunday Peak Hour
        - Westbound Left, AM Peak Hour
        - Northbound Left, AM and PM Peak Hour
        - Northbound Left/Thru, AM and PM Peak Hour
        - Northbound Right, AM and PM Peak Hour
        - Southbound Left, AM and PM Peak Hour
        - Southbound Thru/Right, AM and PM Peak Hour

- In order to determine future (2021) traffic volumes on the roadways in the vicinity of the site under the 2021 build out condition, the site-generated traffic volumes were added to the future (2021) without development traffic volumes. The proposed development will generate a total of 33 new trips in the weekday morning peak hour, 45 new trips in the weekday afternoon peak hour, and 32 new trips in the Sunday peak hour.
- With the addition of site traffic to the road network, all movements at the study intersections continue to operate at levels of service consistent with those in the Future (2021) With Development scenario.
- Access to the Church of the Resurrection site is provided via a separate driveway parallel to the Private Drive serving the Goodwin House. The existing access to the church parking lot from the Private Drive serving the Goodwin House will be restricted to emergency vehicle access only, and future access to the church parking lot will be provided via the new site driveway. Therefore, no new site trips have been added to the Private Drive serving the Goodwin House, and there are no new impacts to queuing or delay along the Private Drive.
- A TMP will be required for this site and a TMP Framework has been included in the report.
- The study results indicate that the additional trips generated by the new apartment building and church will have a negligible impact on the operations of the study intersections. The analysis results presented in the Future (2021) With Development scenario are consistent with the results for the Future (2021) Without Development scenario, which shows conditions in 2021 without trips generated by this project.

INTRODUCTION AND SUMMARY

The following report presents the findings of a Traffic Impact Study (TIS) conducted for the proposed redevelopment of the 2280 N Beauregard Street site in the City of Alexandria, Virginia.

The site is currently occupied by the Church of the Resurrection. Under the proposed plan, the redevelopment will replace the 13,800 square foot church structure with two buildings: one that includes 113 affordable dwelling units (ADUs) and one that includes approximately 5,000 square feet dedicated to the church. A total of 112 parking spaces will be provided in the parking garage, a surface lot, and on-street. A total of 84 spaces will be dedicated for the residential use and 28 for church uses, including 6 tandem spaces. The proposed build out year is 2021.

Study Objectives

The objectives of this study are to evaluate the transportation network in the vicinity of the site and identify any potential transportation impacts that may result from the proposed redevelopment. Elements of this report include a description of the proposed development, an evaluation of the existing transportation network, and evaluations of the future transportation network with and without the proposed development.

Study Tasks

The following tasks were completed as part of the study:

- A scoping meeting was conducted on January 14, 2016 with representatives from the City of Alexandria Department of Transportation and Environmental Services, and the meeting included discussions about the parameters of the study and relevant background information. A copy of the signed scoping letter confirming the parameters and assumptions used in the TIS is included in Appendix A.
- Field reconnaissance in the vicinity of the site was performed to collect information related to existing traffic controls, roadway geometry, and traffic flow characteristics.
- Traffic counts were collected at four (4) of the eight (8) study area intersections on Thursday, February 4, 2016 during the AM and PM peak hours. All other weekday intersection counts were previously collected in 2012 and 2013 and provided by the City of Alexandria staff. Sunday intersection counts were taken on February 7, 2016 at all intersection locations. All volumes were grown to provide 2017 existing conditions in the study.
- Regional growth was based on historical ADT volumes published by VDOT and consistent with other traffic studies in the area. Six background developments in the vicinity of the proposed development were identified to be included in the analysis per discussions held at the scoping meeting.
- Future traffic conditions were estimated based on existing traffic volumes, regional growth, traffic generated by other developments in the study area, and the proposed development plan.
- Proposed site traffic volumes were generated based on methodology outlined in the Institute of Transportation Engineers' (ITE) Trip Generation, 9th Edition publication.
- Intersection capacity analyses were performed using the software package *Synchro, Version 9.1* based on the Highway Capacity Manual (HCM) methodology. HCM 2010 was used to analyze the unsignalized intersections. HCM 2000 was used to analyze the signalized intersections due to the limitations of HCM 2010. Traffic analyses were performed for the existing conditions (2017) and future with and without development conditions (2021).

- A Transportation Management Plan framework was developed as a TMP will be necessary to meet City requirements.

Data Sources

Sources of data for this study include Institute of Transportation Engineers (ITE) Trip Generation, 9th Edition, the City of Alexandria, the Virginia Department of Transportation (VDOT), AHC Inc., Walter L Phillips Inc., and the office files and field reconnaissance efforts by Gorove/Slade Associates, Inc.

PROPOSED DEVELOPMENT AND CONTEXT

Site Description

Site Location

The site is located within the Beauregard Small Area Plan area. The site is bounded by Fillmore Avenue to the north, the Goodwin House (an existing retirement community) to the east and south, and N Beauregard Street to the west. The site location is shown in Figure 1.

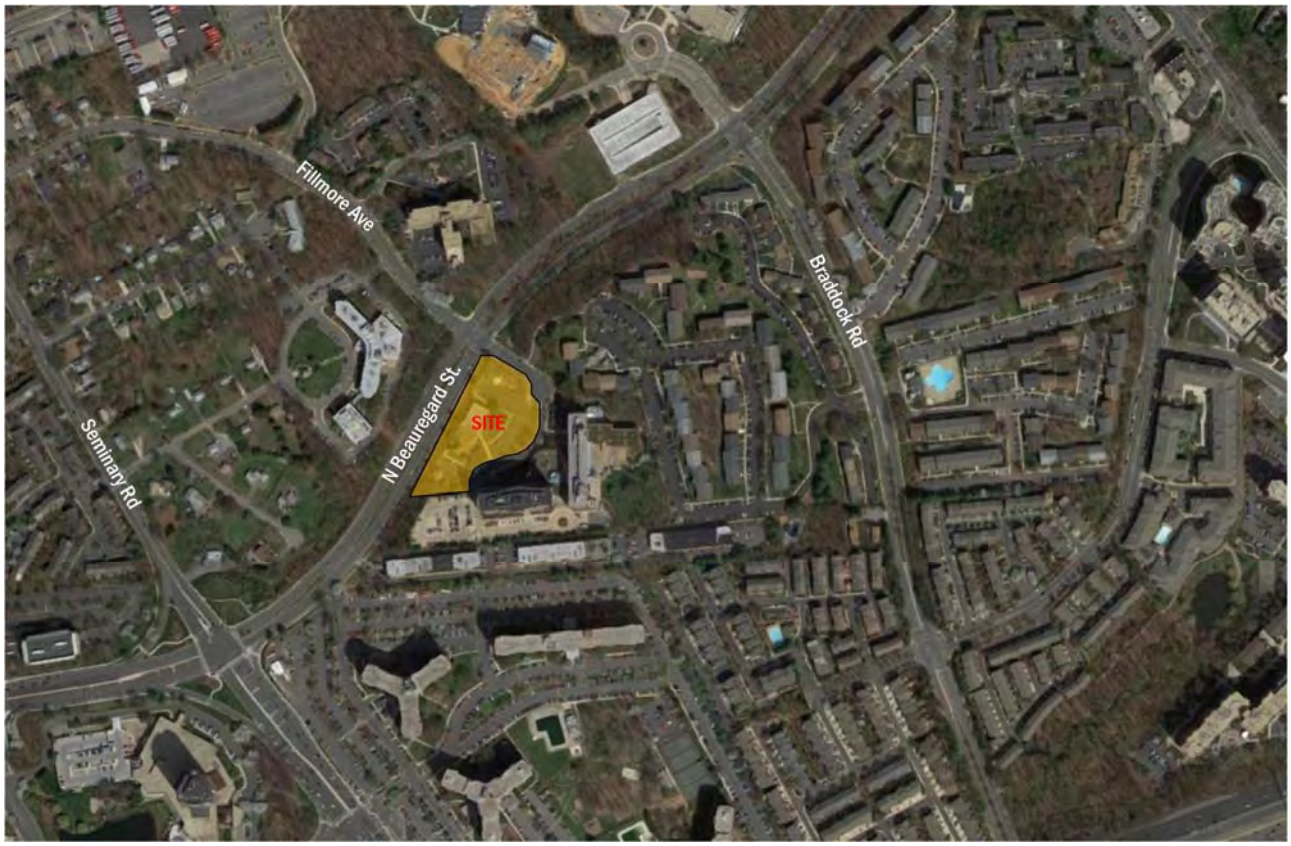

Figure 1: **Site Location**

Proposed Site Plan

The proposed site will include a total of 113 affordable dwelling units (ADUs) and approximately 5,000 square feet dedicated to the church. A total of 112 parking spaces will be included for church and residential uses: an 80-space enclosed garage provided for the residents of the development, an existing 20-space surface parking lot to be expanded to 25 spaces and remain for church usage, and seven on-street spaces. The proposed site plan is presented on Figure 2.

Vehicular access will be provided via one (1) driveway located off of Fillmore Avenue. An existing curb cut will service the driveway that will provide the entrance to the proposed parking garage and surface lot for the residential and church uses. A curb cut will be added north of the garage entrance to service trash and loading facilities.

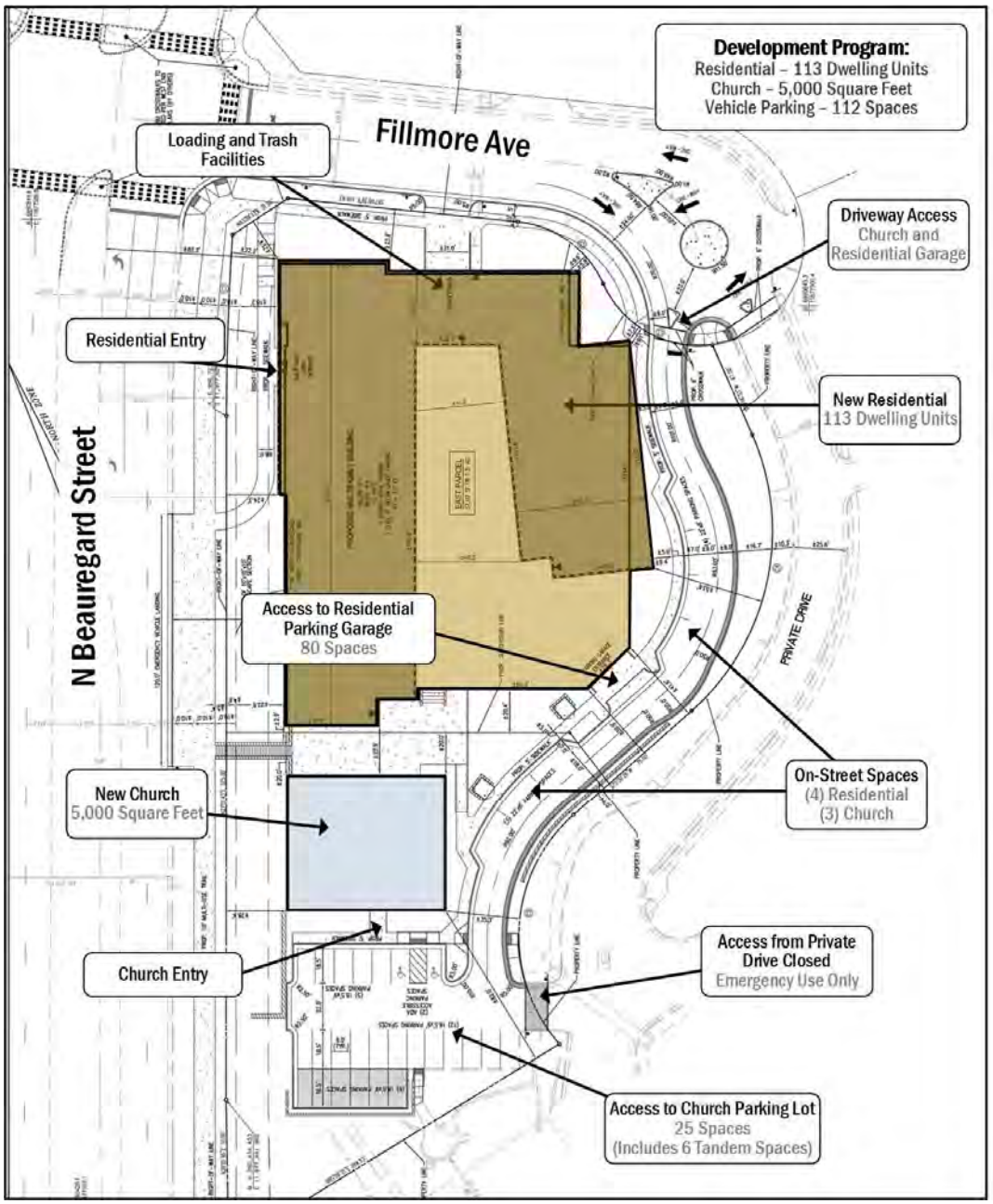

Figure 2: Proposed Site Plan

Parcel Information

The existing property at 2280 N Beauregard Street is currently occupied by the Church of the Resurrection (Tax Map 11.03). A tax map showing the location of the property is presented in Figure 3.

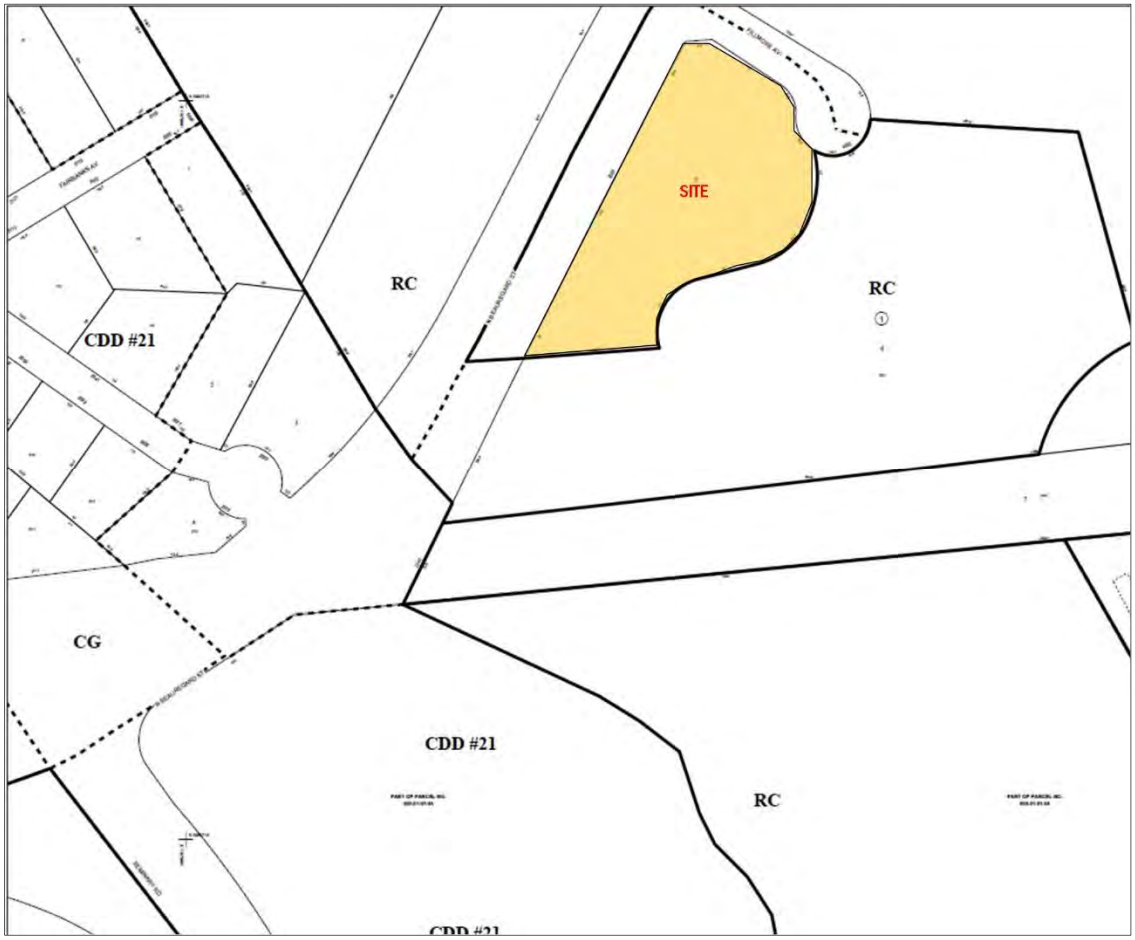

Figure 3: Tax Map (Source: City of Alexandria Tax Map, March 2016)

Zoning Information

According to the City of Alexandria's Zoning Map, the site is zoned Residential High for Multi-Family (RA). The zoning map for the site is shown in Figure 4.

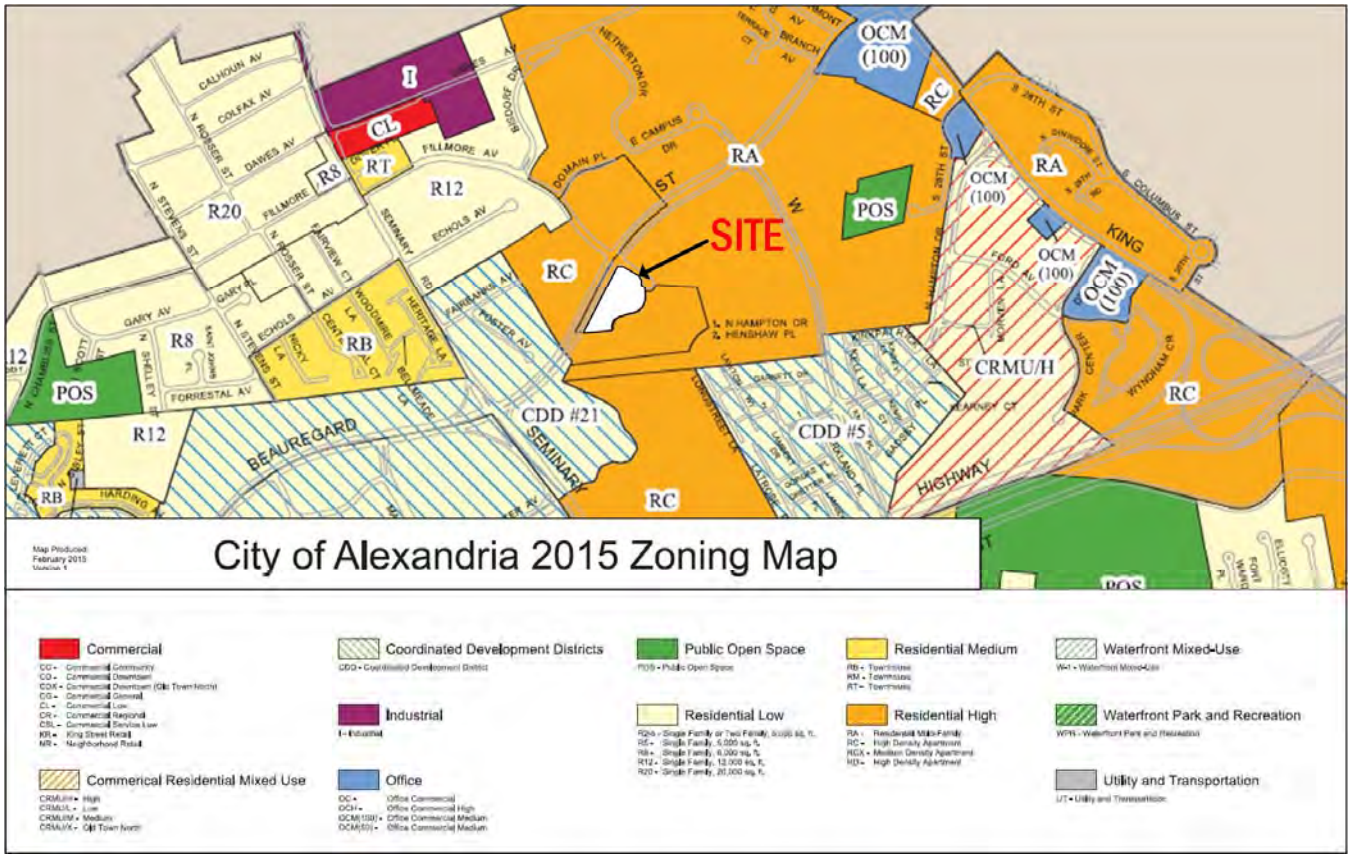

Figure 4: City of Alexandria Zoning Map

Scope and Limits of the Study Area

The following intersections were identified for inclusion in this study, as shown on Figure 5 and Figure 6:

1. N Beauregard Street/Seminary Road
2. N Beauregard Street/Fillmore Avenue
3. N Beauregard Street/Braddock Road
4. Fillmore Avenue/Seminary Road
5. Fillmore Avenue/Newport Village Driveway
6. Fillmore Avenue/Private Drive/Site Driveway/Goodwin House
7. Private Drive/Goodwin House Center Driveway
8. Private Drive/Existing Church Parking/Goodwin House Access/Parking Garage

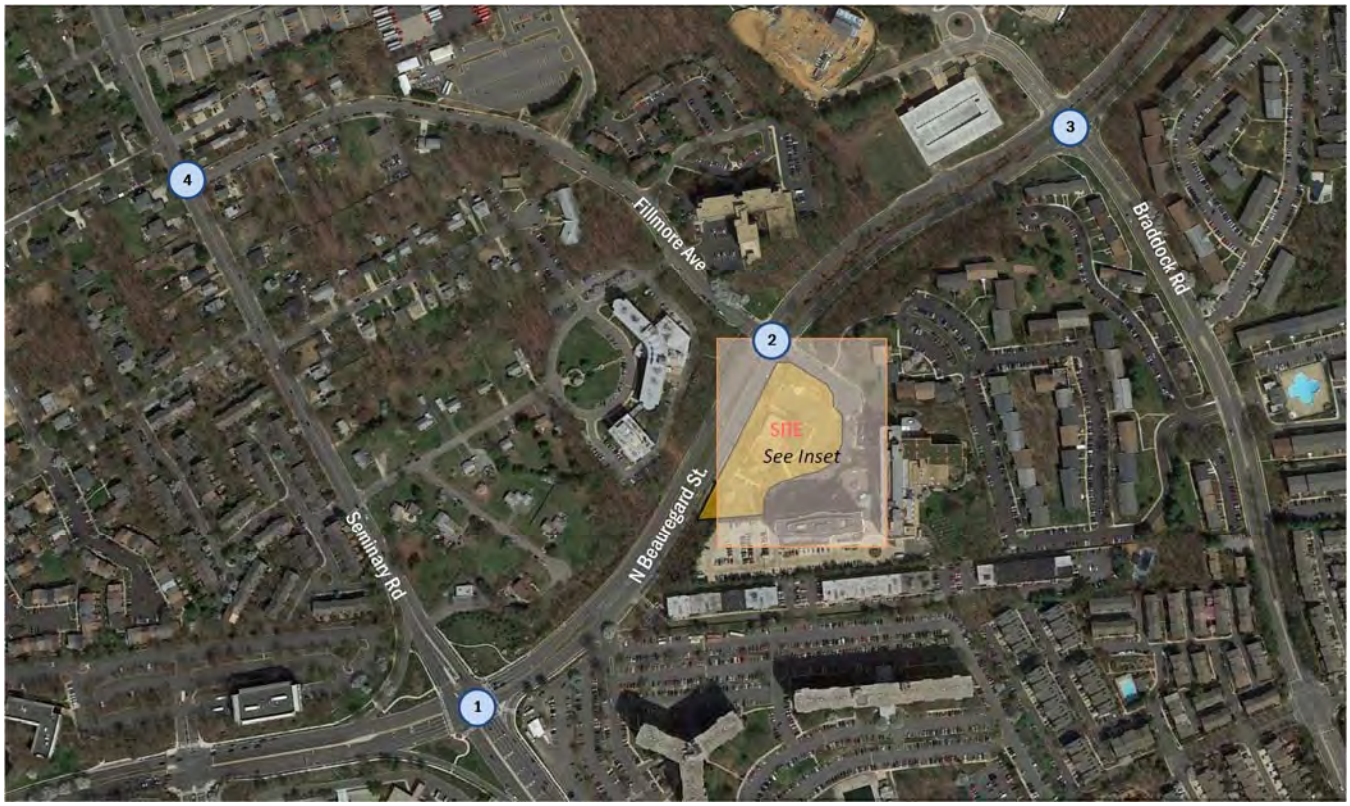

Figure 5: Study Area Intersections 1-4

Figure 6: Study Area Intersections 5-8

EXISTING CONDITIONS (2017)

Existing Transit Facilities

Metrorail

There is no Metro station within a one (1) mile walking distance of the site. The nearest station is the Van Dorn Street Metro station, located approximately 2.65 miles south of the site on Eisenhower Avenue between South Van Dorn Street and Clermont Drive. The station features daily parking, bike parking, and carsharing options. The Van Dorn Street Metro serves the Blue and Yellow line, and average weekday daily ridership at the station in 2016 was approximately 3,052 boardings according to the publication *Metrorail Average Weekday Daily Boardings* (WMATA, June, 2016).

Bus

The study area is served by several Metrobus lines and two DASH lines under existing conditions as shown on Figure 7. There are two existing bus stops adjacent to the site at the intersection of Fillmore Avenue and North Beauregard Street. Both bus stops adjacent to the site provide shelters with benches. These bus stops are served by the following routes:

- **WMATA (Metrobus)** – Nine Metrobus routes and one MetroExtra route serve in an around the site area with bus stops located on N. Beauregard Street, Fillmore Avenue, Seminary Road and Braddock Road Table 1 presents destinations and frequencies for all routes route.
- **Alexandria Transit (DASH)** – Two DASH routes directly serve the bus stops closest to the subject site. These routes are detailed in Table 1.

Table 1: Existing Transit Time Table

Route Number	Route Name	Service Hours	Headway	Walking Distance to Nearest Bus Stop
7A, 7F, 7Y (WMATA)	Lincolnia-North Fairlington Line	Weekdays: 4:58AM – 3:46 AM Weekends: 6:29AM – 3:47 AM	5-72 minutes	<0.1 miles, 1 minute
16L (WMATA)	Annandale-Skyline City-Pentagon Line	Weekdays: 6:30AM – 6:57 PM	26-31 minutes	0.4 miles, 7 minutes
22F (WMATA)	Barcroft-South Fairlington Line	Weekdays: 5:55AM – 8:37 PM	18-30 minutes	0.1 miles, 2 minutes
25B (WMATA)	Landmark-Ballston Line	Weekdays: 5:52AM – 11:21 PM Weekends: 6:29AM – 9:21 PM	11-90 minutes	0.1 miles, 2 minutes
28A (WMATA)	Leesburg Pike Line	Weekdays: 4:23AM – 1:24 AM Weekends: 6:19AM – 1:35 AM	8-30 minutes	0.1 miles, 2 minutes
28F, 28G (WMATA)	Skyline City Line	Weekdays: 5:50AM – 7:23 PM	19-30 minutes	0.1 miles, 2 minutes
28X (WMATA)	Leesburg Pike Limited Line	Weekdays: 5:45AM – 7:18 AM	13-30 minutes	0.5 miles, 10 minutes
AT6 (DASH)	King Street-Old Town Metro to NVCC	Weekdays: 5:35AM – 10:43 PM	14-45 minutes	0.1 miles, 2 minutes
AT9 DASH	Mark Center to Potomac Yard	Weekdays: 6:46AM – 9:43 PM	30 minutes	0.1 miles, 2 minutes

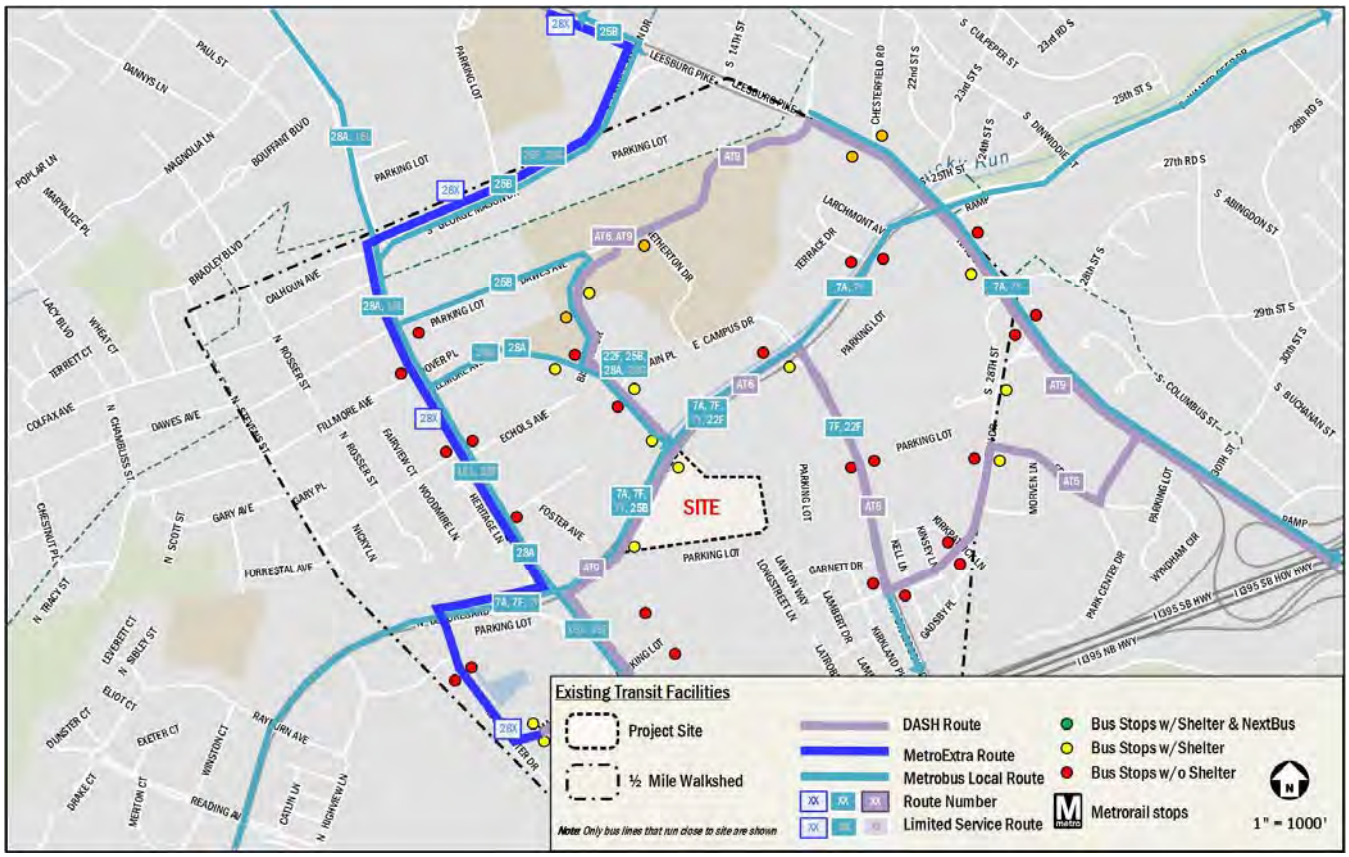

Figure 7: Existing Transit Facilities

Existing Bicycle and Pedestrian Facilities

Bicycle Facilities

Off-street bicycle facilities and bike lanes are provided north of site along South Walter Reed Drive (North Beauregard Street becomes South Walter Reed Drive north of King Street). These bike facilities connect to the Washington & Old Dominion Trail and Four Mile Run northeast of the site. North Beauregard Street east of Seminary Road provides a bicycle connection to east Alexandria. The site is connected to bike routes along West Braddock Road to the north and Seminary Road. Additional Alexandria existing bicycle facilities are shown on Figure 8. The nearest Capital Bikeshare location is over a mile from the site.

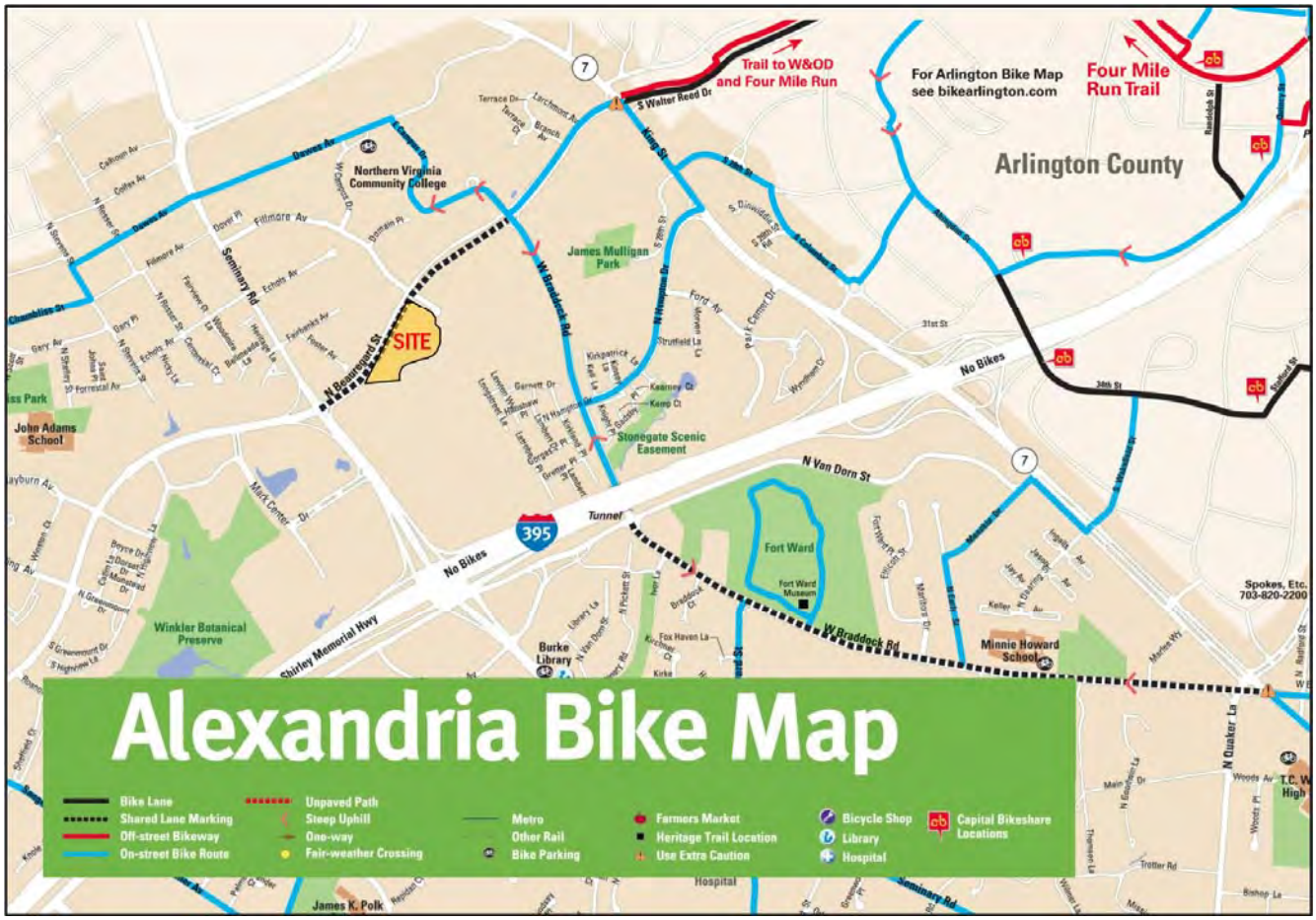

Figure 8: Existing Bicycle Map (Source: City of Alexandria, March 2016)

Excerpts from the City's Pedestrian and Bicycle Mobility Plan (June 2008) are included in Figure 9. This figure shows the bicycle potential as well as indicators for the existing quality of bicycle service in the vicinity of the site. The immediate area on N Beauregard Street and Fillmore Avenue has a medium-to-high potential for bicycle activity, with higher potential on Seminary Road southeast of the site.

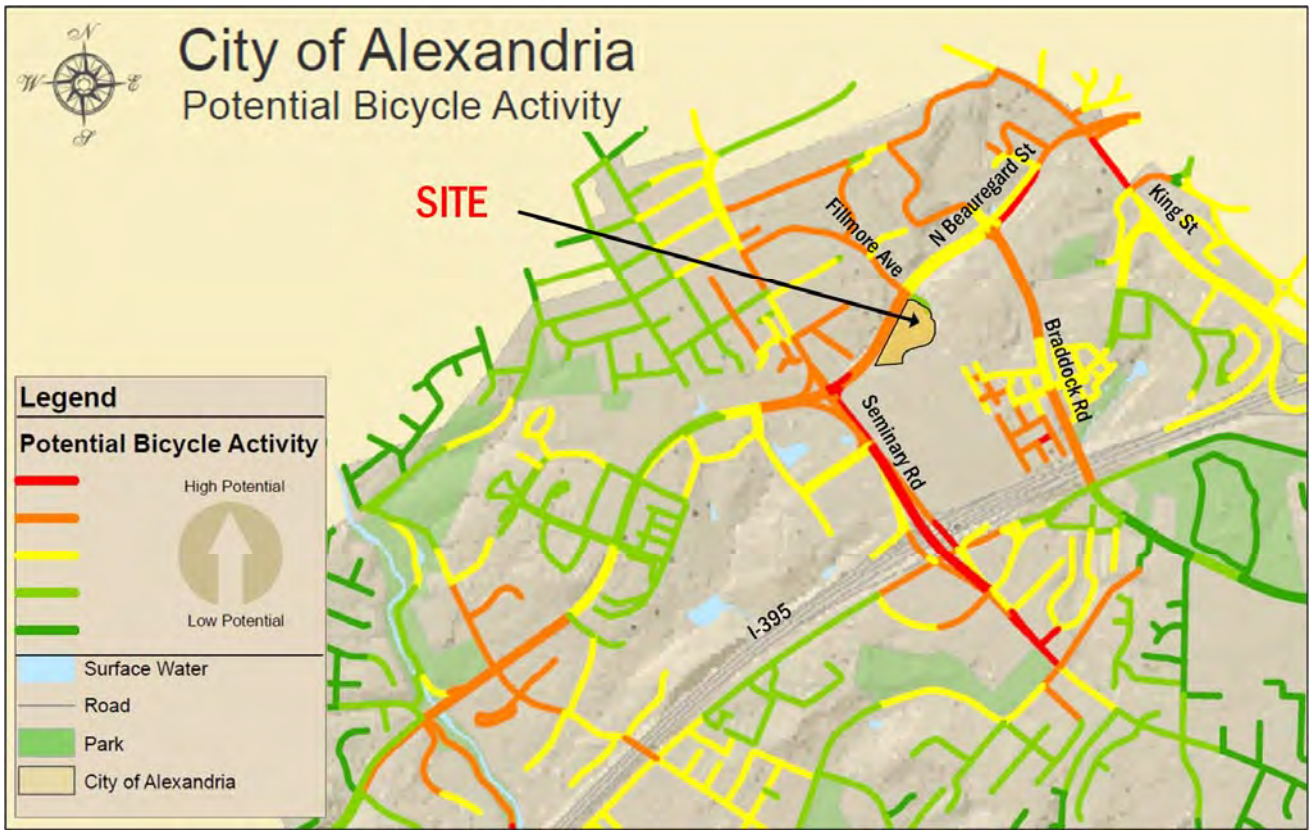

Figure 9: Potential Bicycle Activity (City of Alexandria 2008 Pedestrian and Bicycle Mobility Plan)

Pedestrian Facilities

A pedestrian infrastructure inventory was conducted in accordance with City of Alexandria guidelines. The pedestrian and bicycle inventory area can be generally described by the area included within a 0.25-mile radius around the site, as agreed upon in the scope. The overall pedestrian network surrounding the project site is generally well established, with sidewalks on both sides of nearly all roadway segments and crosswalks at most signalized intersections and minor street approaches. Crosswalks, pedestrian signal push buttons, and ramps are provided at most signalized intersections within the study area. Figure 10 shows the existing pedestrian peak hour volumes at all study area intersections. It should be noted that pedestrian volumes were not collected at all locations during the AM and PM Peak Hour.

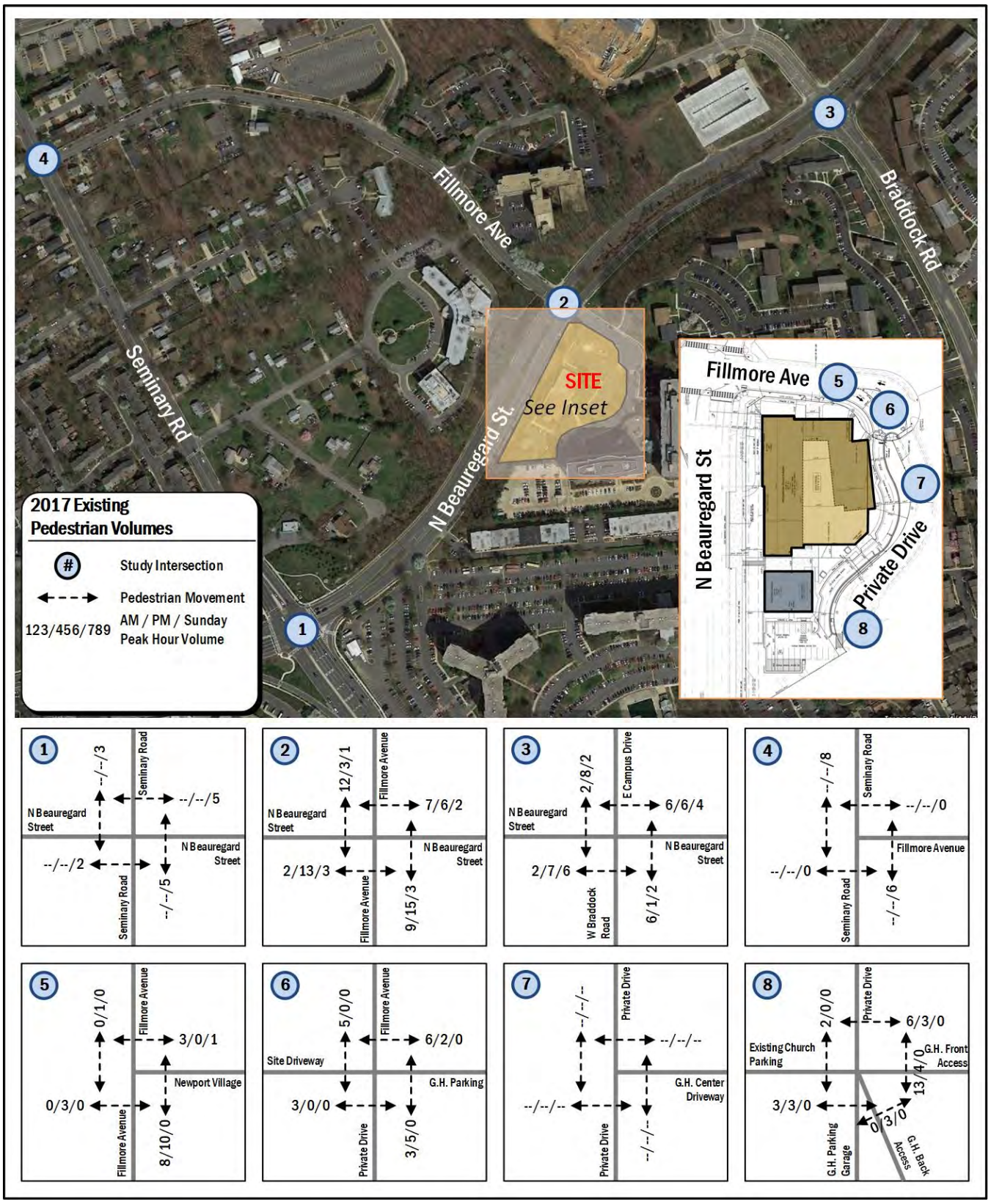

Figure 10: Existing Pedestrian Crossing Peak Hour Volumes

The proposed site has a WalkScore of 62 from WalkScore.com, indicating "Somewhat Walkable", with some errands being accomplished by foot.

Excerpts from the City's Pedestrian and Bicycle Mobility Plan (June 2008) are included in Figure 11. This figure shows the walking potential as well as indicators for the existing quality of pedestrian service in the vicinity of the site. As with the potential bicycle activity, the area around the site shows a medium-to-high potential for pedestrians, particularly along N Beauregard Street, Fillmore Avenue, and Seminary Road.

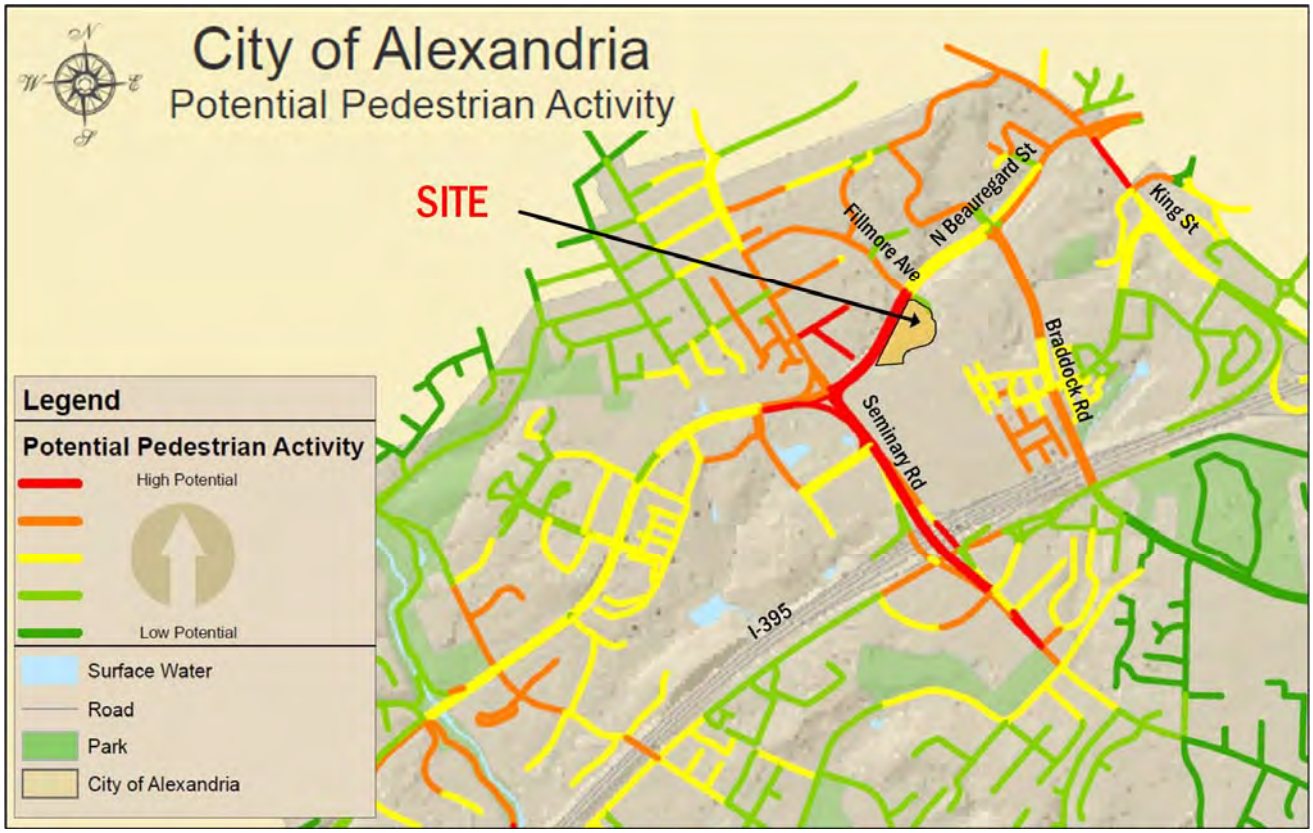

Figure 11: Potential Pedestrian Activity (City of Alexandria 2008 Pedestrian and Bicycle Mobility Plan)

Existing Roadway Network

A description of the roadways within the study area is presented below in Table 2. The existing local roadway network including lane configurations and intersection control is detailed in and illustrated in Figure 12.

Table 2: Existing Roadway Network

Roadway	Classification	Lanes	Speed	On-Street Parking	ADT*
N Beauregard Street	Minor Arterial (VDOT)	4	35 mph	No	17,000
Fillmore Avenue	Minor Collector (VDOT)	2	25 mph	Yes	4,600
Braddock Road	Minor Arterial (VDOT)	4	35 mph	No	12,000
Seminary Road	Minor Arterial (VDOT)	4 to 8	35 mph	No	54,000
King Street	Other Principal Arterial (VDOT)	4 to 5	35 mph	No	45,000

*ADT figures retrieved from VDOT 2016 Traffic Counts Data for City of Alexandria

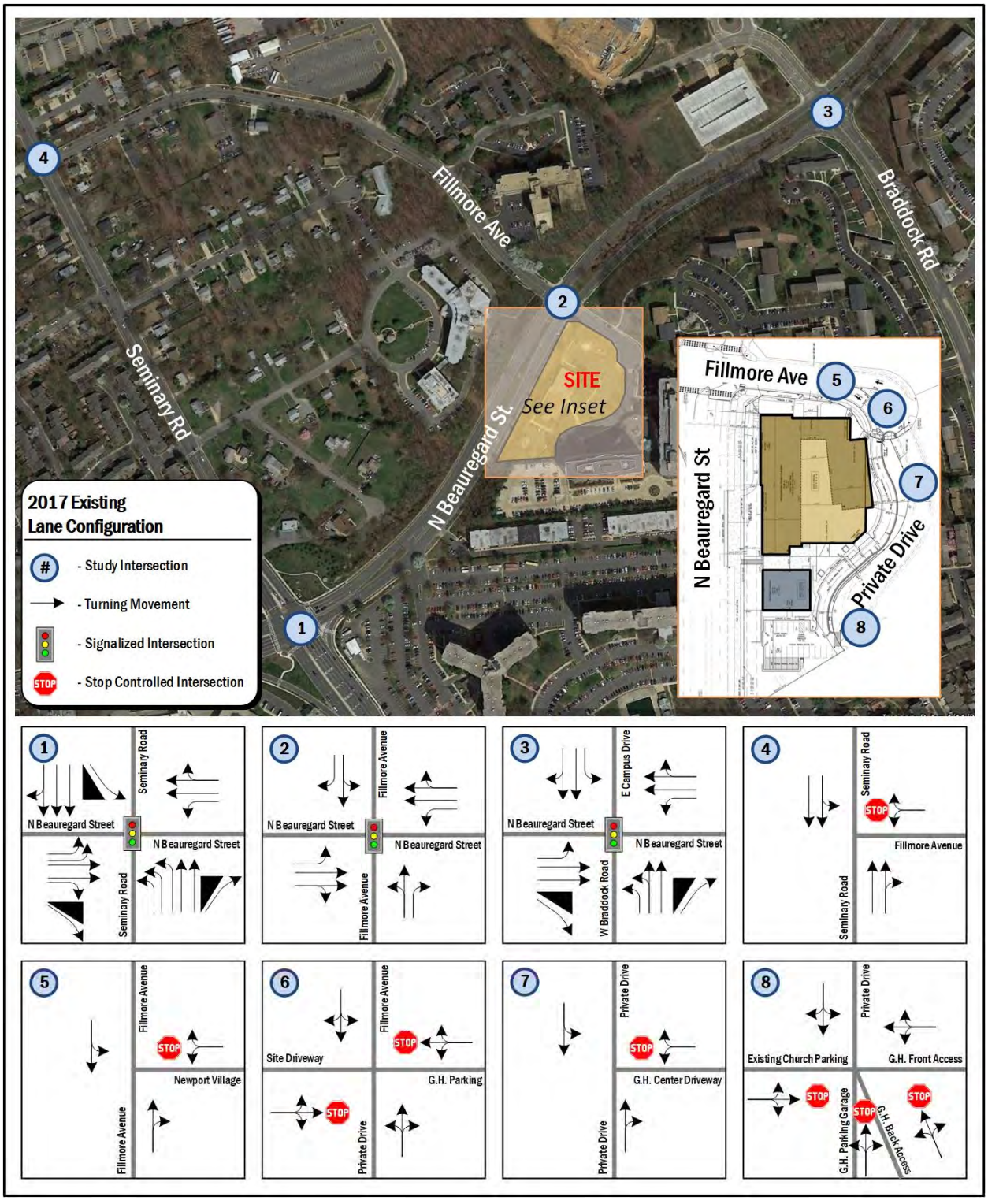

Figure 12: Existing (2017) Lanes and Traffic Control Devices

Existing Traffic Volumes

Traffic counts were collected at four (4) of the eight (8) study area intersections on Thursday, February 4, 2016 during the AM and PM peak hours. Sunday intersection counts were taken on February 7, 2016 at all intersection locations.

City of Alexandria staff provided weekday intersection counts were previously collected in 2012 and 2013 at the following intersections:

- N Beauregard Street and Seminary Road (collected in 2012)
- N Beauregard Street and Braddock Road (collected in 2013)
- Fillmore Avenue and Seminary Road (collected in 2012)

The traffic counts collected in 2012 and 2013 were grown at a compounded 0.5% percent per year rate to 2017 in order to establish base existing volumes for 2017. The counts collected in 2016 were grown at the 0.5% rate for an additional year to establish 2017 volumes. It should be noted, no volume balancing was done between the intersections collected in 2016 and the counts provided by the City of Alexandria Staff.

Analysis of the existing traffic data determined that the morning peak hour of the system occurred from 7:30 AM to 8:30 AM, the afternoon peak hour of the system occurred from 5:00 to 6:00 PM, and the Sunday peak hour of the system occurred from 11:30 AM to 12:30 PM.

The existing peak hour traffic volumes for the intersections within the study area are shown on Figure 13, and the existing turning movement counts are included in the Appendix.

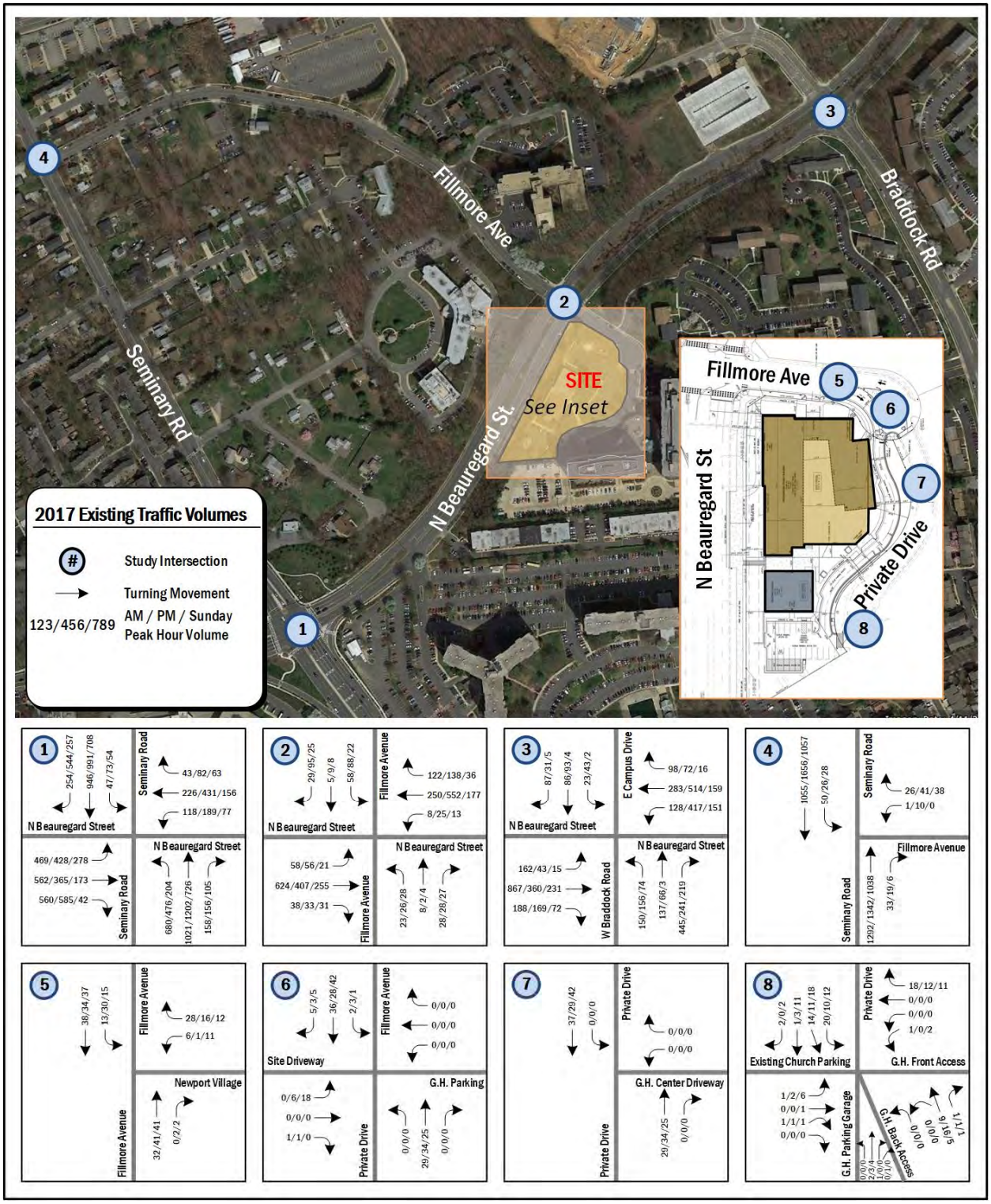

Figure 13: Existing (2017) Traffic Volumes

Existing Capacity Analysis

Capacity analyses were performed at the intersections within the study area during the weekday morning and afternoon peak hours under the existing conditions. *Synchro, Version 9.1* was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology and include level of service, delay, and queue length comparisons for the turning movements analyzed. Signal timing data was obtained from City of Alexandria staff. Signalized intersections were analyzed using HCM 2000 methodology with unsignalized intersections using HCM 2010 methodology

Peak hour factors were applied in accordance with *Transportation Planning Administrative* Guidelines prepared by the City of Alexandria date March 25, 2013. As such, peak hour factors by approach between 0.85 and 1.00 were used for the existing year analysis. Where the calculated peak hour factor based on the existing turning movement counts was greater than 0.85, the calculated factor was applied. Where the calculated factor was 0.85 or less, a factor of 0.85 was applied. A heavy vehicle percentage of 2% was used for existing movements unless determined to be higher from the turning movement counts, in which case the higher percentage was used. A default heavy vehicle percentage of 2% was used for any new movements.

An existing Synchro network was provided by the City of Alexandria for signalized intersections in the study area.

The results of the intersection capacity analyses are presented in Table 3 and are expressed in level of service (LOS) and delay (seconds per vehicle) per lane group. The 95% and 50% queue results for each intersection are also presented in Table 3 and are expressed in feet. The results of the intersection capacity analyses are illustrated on Figure 14. Detailed analysis worksheets are included in the Technical Appendix.

For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of D or better for each lane group at the intersections. The capacity analysis results indicate that all intersections and movements operate at acceptable LOS under existing conditions, with the exception of the following movements:

- Intersection 1: N Beauregard Street and Seminary Road
  - Eastbound Left, AM and PM Peak Hour
  - Eastbound Right, PM Peak Hour
  - Westbound Left, AM and PM Peak Hour
  - Westbound Thru/Right, AM Peak Hour
  - Northbound Left, PM Peak Hour
  - Southbound Left, AM Peak Hour
- Intersection 2: N Beauregard Street and Fillmore Avenue
  - Eastbound Left, AM and Sunday Peak Hour
  - Westbound Left, PM Peak Hour
  - Northbound Left/Thru, AM Peak Hour
  - Northbound Right, AM Peak Hour
  - Southbound Left/Thru, AM and PM Peak Hour
  - Southbound Right, AM and PM Peak Hour

- Intersection 3: N Beauregard Street and Braddock Road
  - Eastbound Left, AM, PM, and Sunday Peak Hour
  - Westbound Left, AM Peak Hour
  - Northbound Left, AM and PM Peak Hour
  - Northbound Left/Thru, AM and PM Peak Hour
  - Northbound Right, AM and PM Peak Hour
  - Southbound Left, AM and PM Peak Hour
  - Southbound Thru/Right, AM and PM Peak Hour

Table 3: Existing (2017) Capacity Analysis Results

Intersection (Movement)	Storage Length	Existing 2017											
		AM Peak				PM Peak				Sunday Peak			
		LOS	Delay	Queue 50th	Queue 95th	LOS	Delay	Queue 50th	Queue 95th	LOS	Delay	Queue 50th	Queue 95th
1 N Beauregard Street and Seminary Road													
Overall Intersection (Signalized)		**D**	**44.2**			**D**	**48.2**			**C**	**27.3**		
Eastbound Left	650	E	61.6	251	296	E	69.3	230	#282	D	41.9	100	140
Eastbound Thru	650	D	48.6	284	321	D	44.5	174	217	D	36.5	61	89
Eastbound Right	550	D	50.2	104	205	F	94.7	~411	#605	D	38.7	0	0
Westbound Left	150	E	69.3	120	#219	E	61.4	195	#302	D	48.4	62	113
Westbound Thru/Right	1200	E	55.1	123	172	D	47.6	258	303	D	41.9	74	68
Northbound Left	400	D	47.0	212	260	E	71.9	163	#227	D	42.6	55	78
Northbound Thru	600	C	26.6	376	472	D	38.2	533	626	B	18.7	198	276
Northbound Right	275	B	19.4	0	36	C	24.5	21	67	B	14.7	0	13
Southbound Left	100	E	60.7	42	84	D	54.2	67	m97	D	45.2	40	76
Southbound Thru	550	D	43.0	278	336	C	20.6	272	131	B	19.3	124	165
Southbound Right	250	D	40.1	0	70	C	30.7	310	183	C	21.0	0	48
2 N Beauregard Street and Fillmore Avenue													
Overall Intersection (Signalized)		**B**	**15.7**			**C**	**20.0**			**B**	**13.5**		
Eastbound Left	160	E	67.0	55	m54	D	45.2	30	102	E	61.4	18	41
Eastbound Thru/Right	775	A	4.3	8	371	A	7.4	160	233	A	3.7	3	123
Westbound Left	80	D	53.8	6	m25	E	76.7	28	62	D	50.8	7	26
Westbound Thru/Right	1050	A	7.6	76	101	A	6.4	87	104	A	2.4	40	41
Northbound Left/Thru	110	E	57.2	31	53	D	53.2	27	50	D	45.4	26	41
Northbound Right	50	E	55.5	0	0	D	51.8	0	0	D	43.9	0	0
Southbound Left/Thru	300	E	72.7	68	m95	E	69.3	104	m141	D	47.2	24	41
Southbound Right	50	E	55.6	0	m0	E	75.6	7	m49	D	44.0	0	m0
3 N Beauregard Street and Braddock Road													
Overall Intersection (Signalized)		**D**	**36.1**			**C**	**33.5**			**C**	**26.2**		
Eastbound Left	75	E	74.6	155	250	F	80.5	43	88	E	76.2	13	36
Eastbound Thru	1100	B	12.2	135	500	B	20.5	102	71	A	6.4	19	34
Eastbound Right	75	A	5.0	3	33	B	14.8	10	16	A	9.8	0	0
Westbound Left	90	E	57.3	117	186	D	36.3	363	#641	D	43.0	111	#228
Westbound Thru/Right	725	C	20.4	92	190	B	13.4	132	284	A	8.2	8	81
Northbound Left	200	E	58.2	106	143	E	61.1	85	130	D	45.2	31	53
Northbound Left/Thru	650	E	57.2	110	127	E	59.3	79	103	D	43.8	17	28
Northbound Right	50	E	61.2	60	143	E	57.2	0	72	D	44.3	0	50
Southbound Left	100	E	58.8	24	46	E	60.3	45	75	D	48.6	1	7
Southbound Thru/Right	250	E	60.4	47	71	E	60.7	54	75	D	48.6	1	8
4 Fillmore Avenue and Seminary Road													
Overall Intersection (Unsignalized)		**A**	**1.3**			**A**	**3.8**			**A**	**0.8**		
Westbound Left/Right	--	C	19.9	-	10	C	16.7	-	15	B	14.0	-	8
Northbound Thru/Right	425	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru	100	B	13.4	-	10	B	13.2	-	5	B	12.0	-	5
Southbound Thru	100	A	1.9	-	0	A	6.4	-	0	A	0.8	-	0

Intersection (Movement)	Storage Length	Existing 2017											
		AM Peak				PM Peak				Sunday Peak			
		LOS	Delay	Queue 50th	Queue 95th	LOS	Delay	Queue 50th	Queue 95th	LOS	Delay	Queue 50th	Queue 95th
5 Fillmore Avenue and Newport Village													
Overall Intersection (Unsignalized)		**A**	**3.4**			**A**	**3.0**			**A**	**2.7**		
Westbound Left/Right	250	A	8.8	-	3	A	8.7	-	3	A	8.9	-	3
Northbound Thru/Right	75	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru	125	A	7.4	-	0	A	7.4	-	3	A	7.3	-	0
6 Fillmore Avenue/Private Drive and Site Driveway/Goodwin House													
Overall Intersection (Unsignalized)		**A**	**0.4**	-		**A**	**1.1**			**A**	**1.9**		
Eastbound Left/Thru/Right	50	A	8.6	-	0	A	9.1	-	0	A	9.1	-	3
Westbound Left/Thru/Right	50	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Northbound Left/Thru/Right	75	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru/Right	75	A	7.8	-	0	A	7.3	-	0	A	7.3	-	0
7 Private Drive/Goodwin House Center Driveway													
Overall Intersection (Unsignalized)		**A**	**0.0**	-		**A**	**0.0**			**A**	**0.0**		
Westbound Left/Right	50	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Northbound Thru/Right	215	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru	75	A	0.0	-	0	A	0.0	-	0	A	0.0	-	3
8 Private Drive/Ex. Church Parking/Goodwin House Access/Garage													
Overall Intersection (Unsignalized)		**A**	**7.1**			**A**	**7.0**			**A**	**7.1**		
Eastbound Left/Thru/Right	25	A	6.9	-	0	A	7.0	-	0	A	7.3	-	0
Westbound Left/Thru/Right	125	A	7.0	-	3	A	6.5	-	0	A	6.6	-	0
Northbound Left/Thru/Right*	--	A	7.0	-	3	A	7.1	-	3	A	7.0	-	0
Southbound Left/Thru/Right	215	A	7.3	-	3	A	7.2	-	3	A	7.3	-	5

m - Volume for 95th percentile queue is metered by upstream signal

- 95th percentile volume exceeds capacity, queue may be longer

~ - Volume exceeds capacity, queue is theoretically infinite

* - Existing five-way intersection analyzed as four-way in Synchro due to limititations of HCM capacity analysis

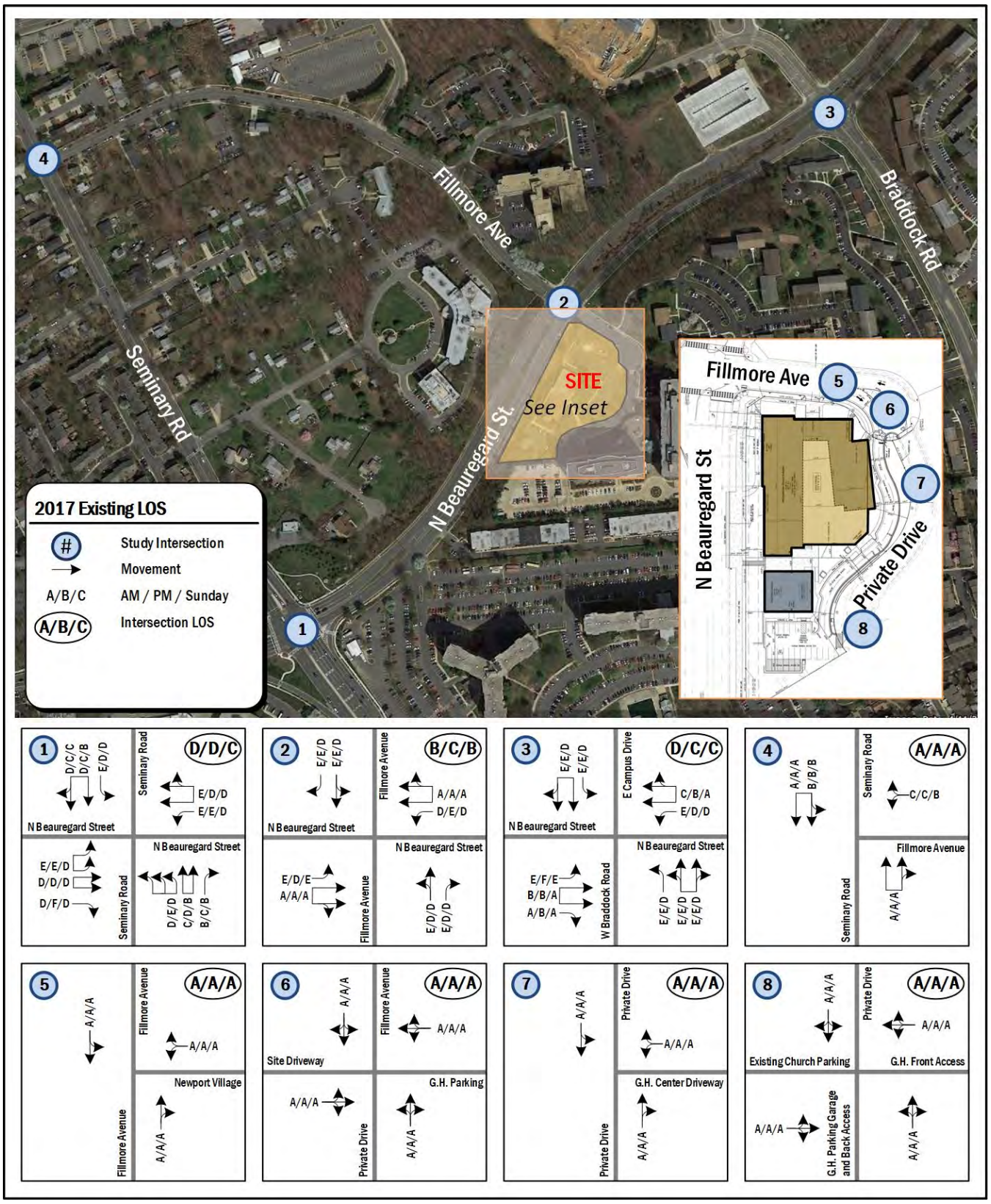

Figure 14: Existing (2017) Capacity Analysis Results

FUTURE (2021) WITHOUT DEVELOPMENT CONDITIONS

Planned Future Transportation Improvements

Planned Roadway Improvements

A reversible High Occupancy Vehicle (HOV) ramp from I-395 to Seminary Road opened in January 2016. The Virginia Department of Transportation project connected the I-395 HOV lanes to the top level of the Seminary Road interchange.

The King Street (Route 7)/Beauregard Street intersection will undergo improvements in order to increase capacity and safety. An additional left-turn lane will be created in both directions along King Street, along with medians on King Street and a shared use path on portions of King Street. The entire project is scheduled to enter construction in Spring 2016 and completed in late 2018.

N Beauregard Street in the vicinity of the project site is cited as a potential route for the *West End Transitway*, a Bus Rapid Transit (BRT) system proposed by the City of Alexandria that provide services between the Van Dorn Street and Pentagon Metro stations. Currently the project is in the Alternatives Analysis and Environmental Documentation phase. If constructed, the roadway profile along North Beauregard Street would be significantly altered and could effect on-street parking along Fillmore Avenue.

No roadway improvements are planned in the study area for the future 2021 development scenarios; therefore no planned roadway improvements have been included in this study.

Future Transit Improvements

In 2008 and 2009, the Leesburg Pike Line (Bus Route 28) was studied by WMATA in association with Fairfax County, City of Falls Church, and City of Alexandria. The route was selected due to passenger feedback concerning slower than normal travel times and a lack of schedule reliability. Following a series of public meetings, technical analysis, and WMATA Metro board approval, changes were made to the route. The input of slow travel times on the route led to the creation of a limited-stop line, the 28X. With fewer stops in the Leesburg area, it is expected that service times will improve in other areas of the route, including in Alexandria in the vicinity of the site area.

Future Bicycle and Pedestrian Improvements

According to the City of Alexandria's 2008 Pedestrian and Bicycle Mobility Plan, upgrades are proposed for the existing bicycle and pedestrian facilities along North Beauregard Street and King Street. As shown in Figure 15, these upgrades consist of constructing a side path or widening the existing sidewalk. The City has also identified recommended sidewalk improvements, which include reconstructing the existing sidewalk along parts of King Street near the North Beauregard Street intersection, along with long term improvements of creating a buffer along Fillmore Avenue and North Beauregard Street in the vicinity of the site. Figure 16 details the status of the 2008 recommended improvements, as noted in the City's 2016 Draft Pedestrian and Bicycle Master Plan.

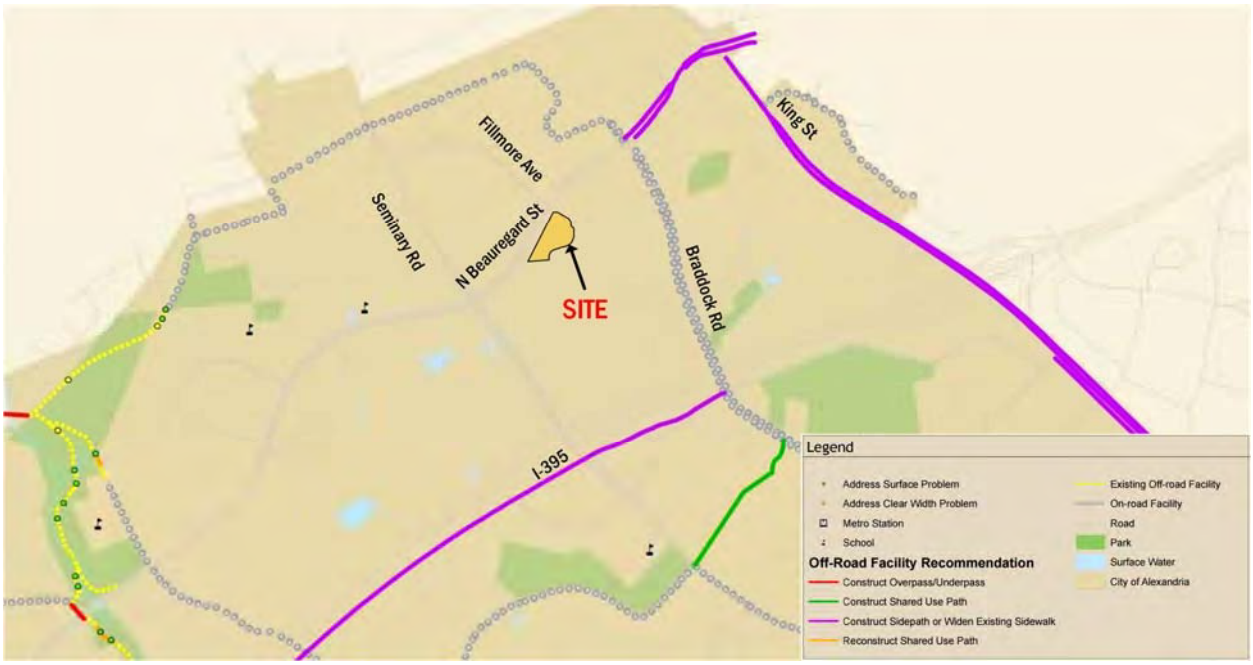

Figure 15: Off-Street Bikeways Program (Source: City of Alexandria Bicycle and Pedestrian Mobility Plan)

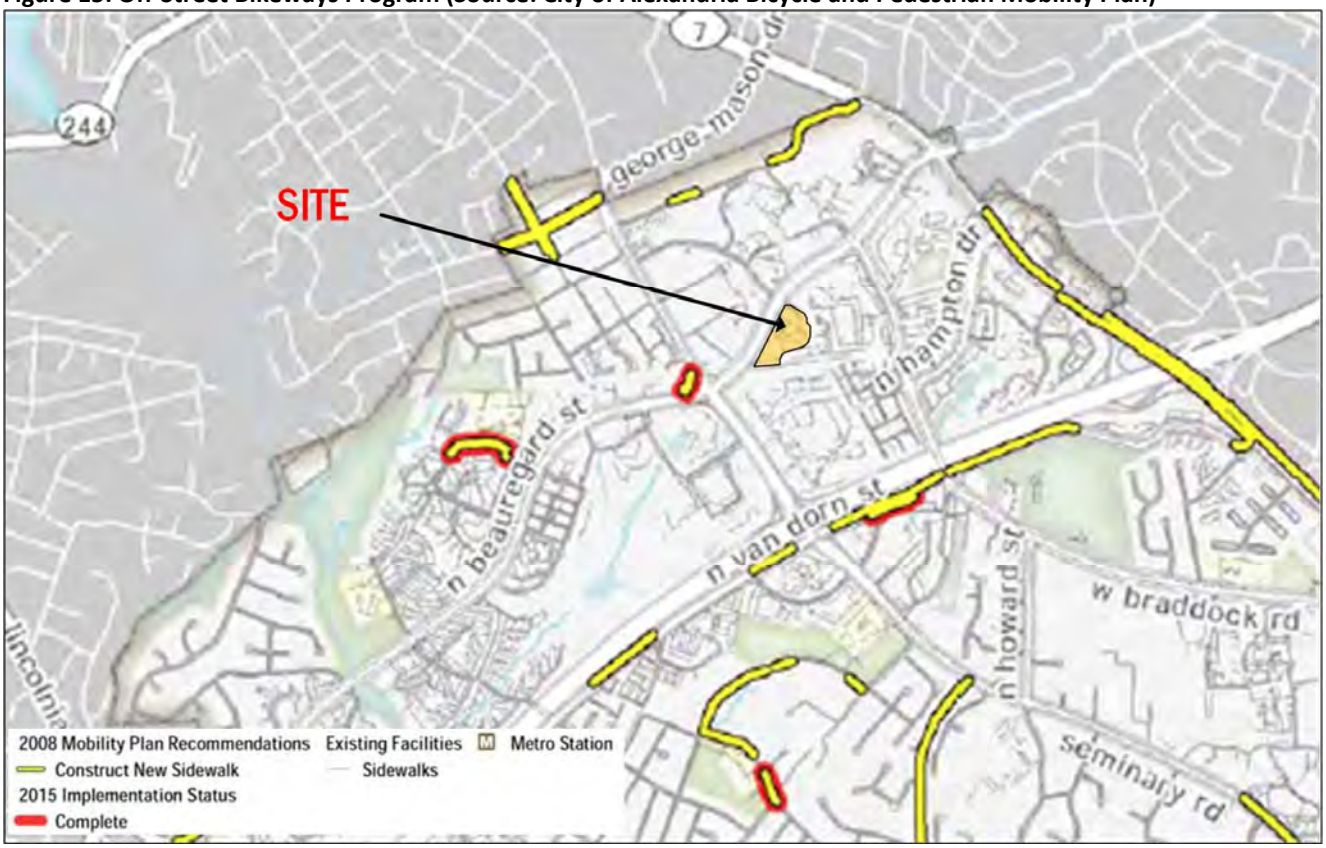

Figure 16: Recommended Sidewalk Improvements (City of Alexandria 2016 Bicycle and Pedestrian Mobility Draft Plan)

Future (2021) without Development Traffic Volumes

The proposed redevelopment is anticipated to be completed by 2021. The future traffic volumes were projected by increasing the existing traffic volumes to the buildout year using background growth rate based on historical traffic growth provided by VDOT as well as previous studies in the area.

According to historical data obtained from VDOT, there has been some growth within the study areas in recent years. A 0.5% growth per year over a two year period was applied to the existing volumes to account for regional increases in traffic. The total traffic generated by the regional background growth is presented in Figure 17.

In addition to the regional background growth, six approved developments in the vicinity of the site were taken into consideration. As discussed at the scoping meeting, the following developments were included in the analysis:

- **Gateway at King and Beauregard:** The site is located on the southeast corner of the King Street-N. Beauregard Street intersection. It is anticipated to be built by 2021 and will be a mixed-use development consisting of 352 units, 116,000 sf of retail, and 94,000 sf of office development. The project is expected to generate 317 weekday AM peak hour vehicle trips, 526 weekday PM peak hour vehicle trips, and 311 Sunday peak hour vehicle trips based on the Traffic Impact Study prepared by Gorove/Slade Associates with revision date September 10, 2015.
- **St. James Plaza Apartments:** The site is located south of Fillmore Road, north of Echols Road, and west of the Hermitage Retirement Community building. It is anticipated to be built by 2021 and will consist of 93 residential units and 31 residential townhomes. The initial Traffic Impact Study prepared by Gorove/Slade Associates dated October 24, 2014 analyzed an earlier development plan which called for 225 residential units and a 2,000 sf daycare. In order to provide a conservative analysis, the trips generated by the original development plan shown in the 2014 study were used for this analysis. Based on that development program, the project would generate 86 weekday AM peak hour vehicle trips, 103 weekday PM peak hour vehicle trips, and a negative Sunday peak hour trip generation. As a conservative measure, no site trips were added during the Sunday peak hour for this development.
- **Northern Virginia Community College-Alexandria Campus Phase I:** The site is located east of Fillmore Avenue on the campus of Northern Virginia Community College. It is anticipated to be built by 2021. The development will consist of 300 student dwelling units to support an increase of student enrollment. The project is expected to generate 172 weekday AM peak hour vehicle trips, 172 weekday PM peak hour vehicle trips, and 44 Sunday peak hour vehicle trips based on the Traffic Impact Analysis prepared by Wells + Associates dated February 20, 2013.

Three other background developments were also discussed at the scoping meeting. These developments will not have site trips added for analysis for reasons stated below.

- **Goodwin House:** The Goodwin House is located adjacent to the proposed redevelopment site off of Fillmore Avenue. The additional development happening on this site will have a decrease in units; therefore, the background analysis for the site will not contain additional trips.
- **Fairbanks Development:** There is no specific timeline for development.
- **Southern Towers Retail:** There is no specific timeline for development.

The total traffic generated by the background developments is presented in Figure 18. Diagrams showing the trips generated by each background development are presented in Appendix D.

The inherent growth rate in conjunction with the trips generated by the approved background developments were applied to the existing traffic volume in order to generate future (2021) without development traffic volumes. The future (2021) without development traffic volumes are shown in Figure 19.

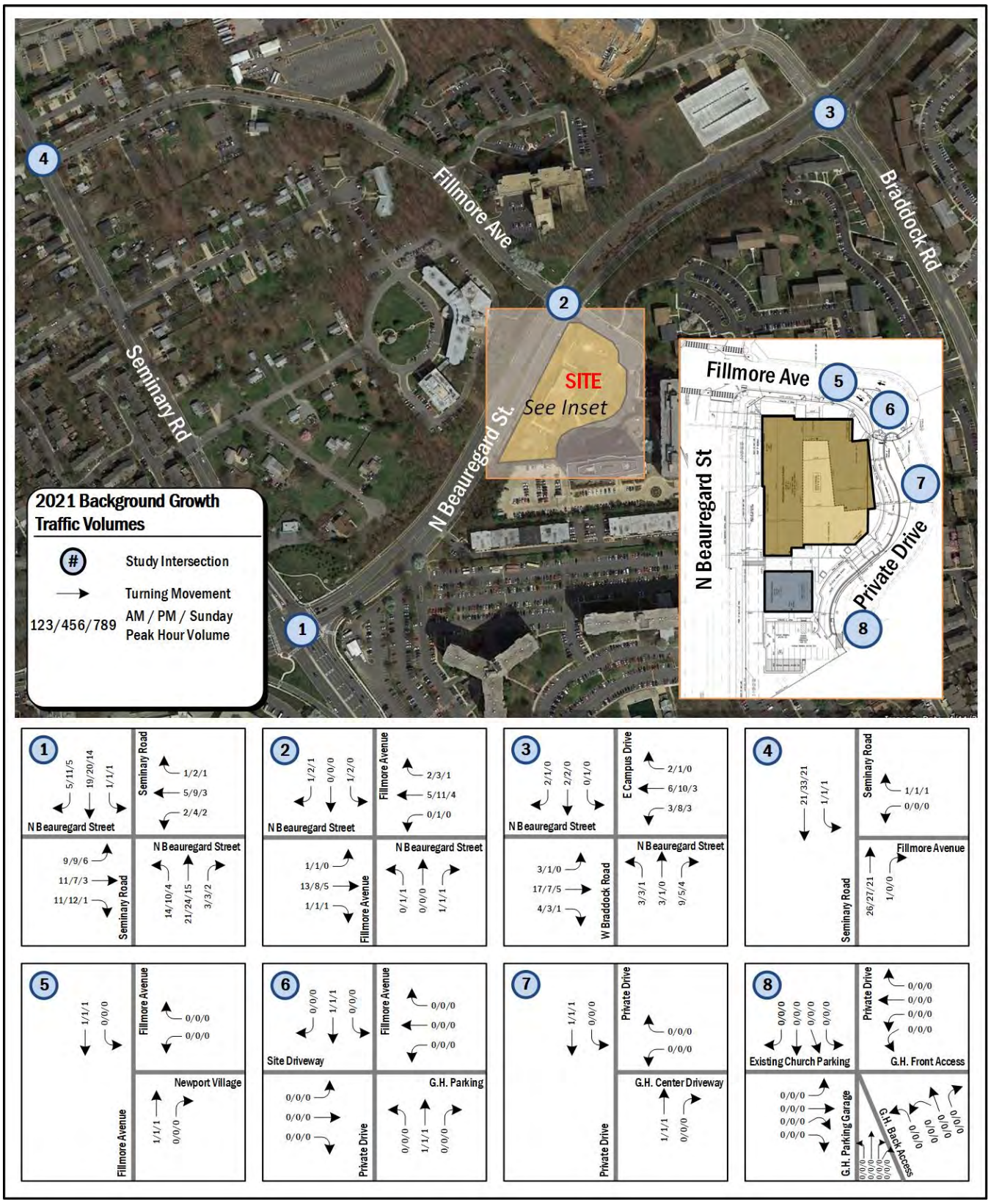

Figure 17: Background Growth Traffic Volumes

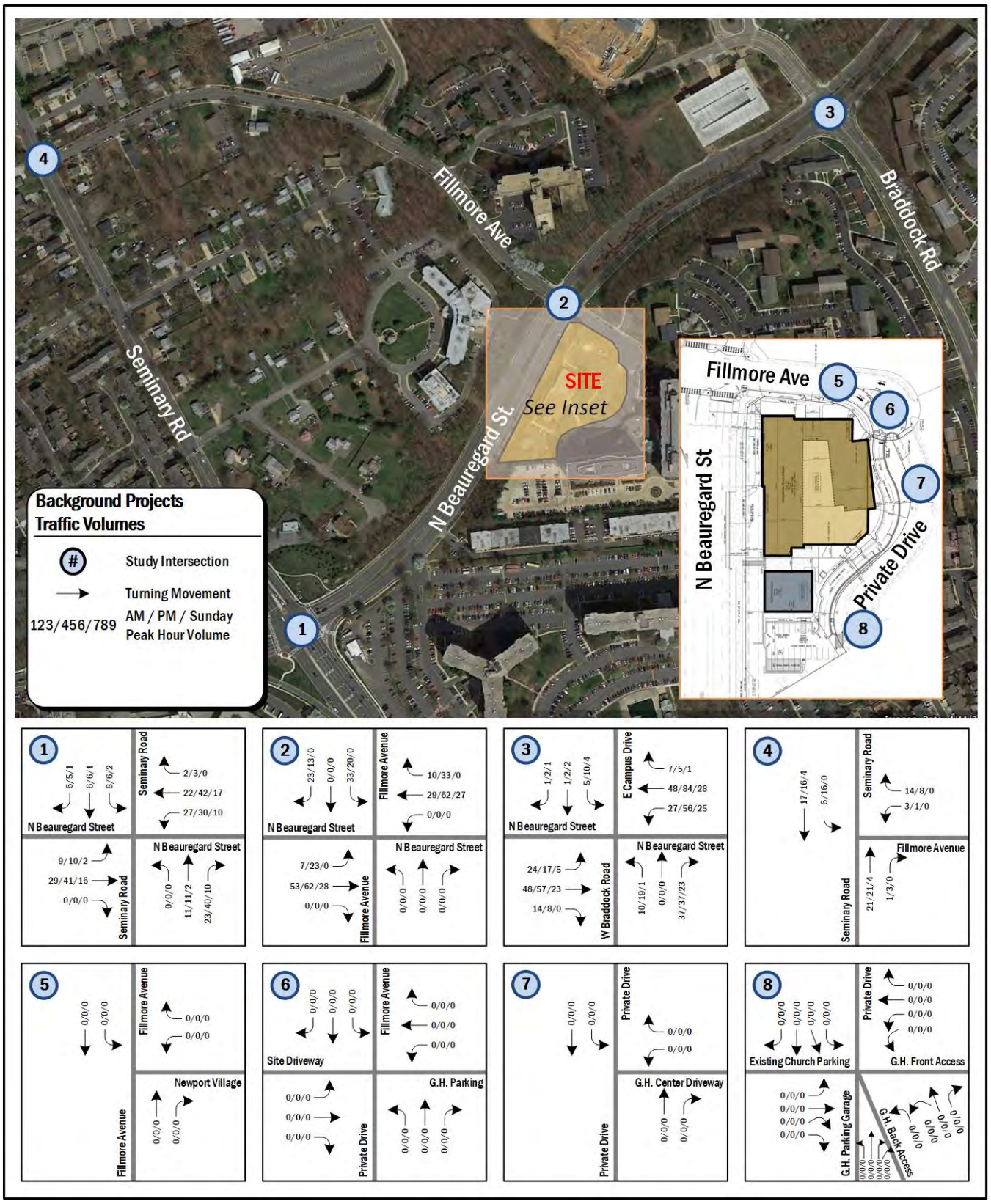

Figure 18: Background Projects Traffic Volumes

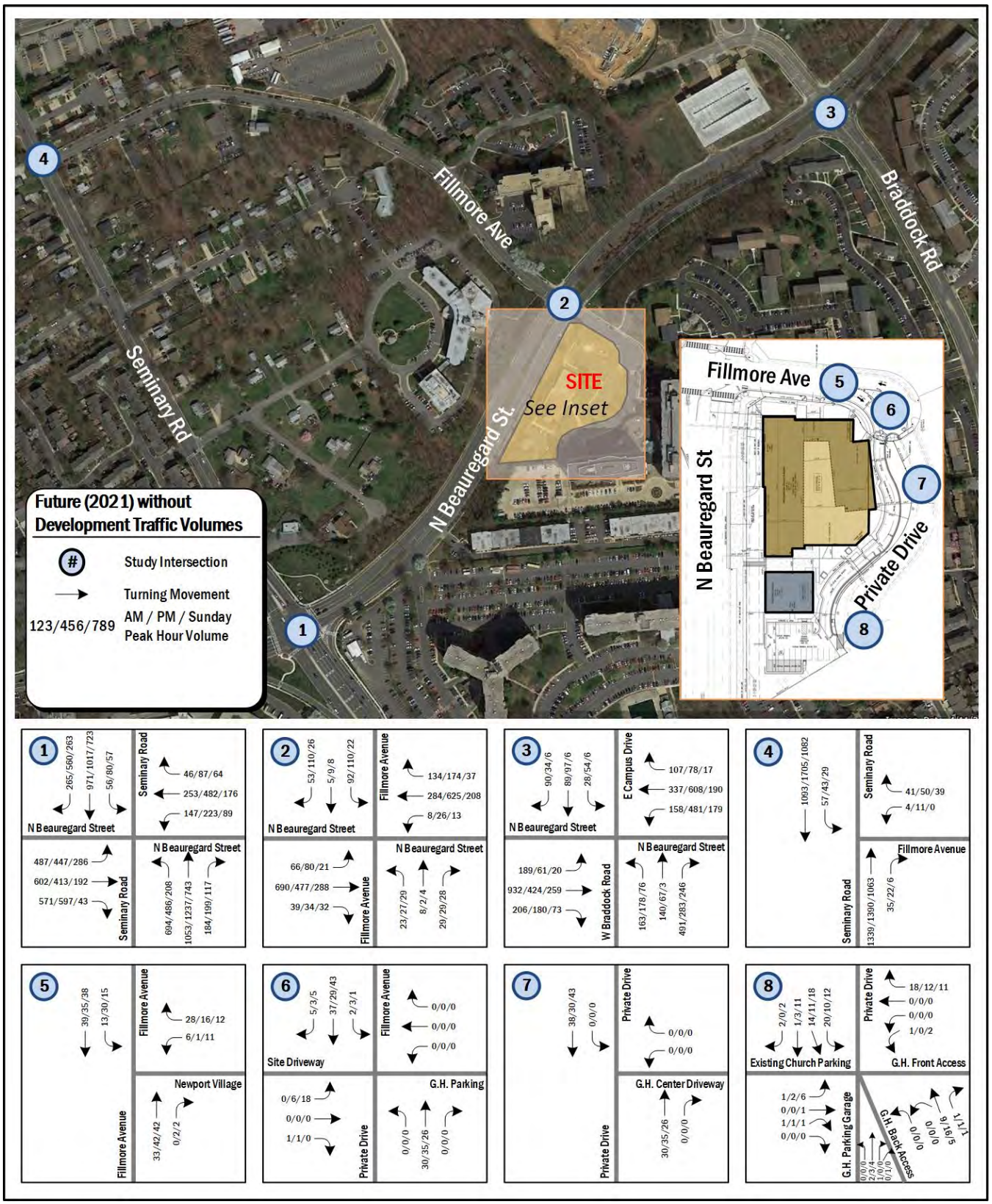

Figure 19: Future (2021) without Development Traffic Volumes

Future (2021) without Development Capacity Analysis

Capacity analyses were performed at the intersections contained within the study area during the weekday morning and afternoon peak hours under the future without development conditions. *Synchro, Version 9.1* was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology and include level of service, delay, and queue length comparisons for the turning movements analyzed. Signalized intersections were analyzed using HCM 2000 methodology with unsignalized intersections using HCM 2010 methodology. Reporting methodology for this scenario is consistent with the existing conditions analysis.

Peak hour factors were applied in accordance with *Transportation Planning Administrative Guidelines* prepared by the City of Alexandria dated March 25, 2013. The guidelines state that "future PHFs should be 15 percent greater than the existing for the future horizon analysis, not to exceed 0.95." As such, a PHF of 0.95 was used for all approaches at each study intersection, as the minimum existing PHF factor used was 0.85.

The results of the intersection capacity analyses are presented in Table 4 and are expressed in level of service (LOS) and delay (seconds per vehicle) per lane group. The 95% and 50% queue results for each intersection are also presented in Table 4. The results of the intersection capacity analyses are shown on Figure 19, and the detailed analysis worksheets are contained in the Technical Appendix.

With an inherent growth rate of 0.5% per year at all movements on public roads at the study intersections and the addition of traffic generated by three pipeline developments, all movements at the study intersections operate at acceptable levels of service with the exception of the following:

- Intersection 1: N Beauregard Street and Seminary Road
  - Eastbound Left, AM and PM Peak Hour
  - Eastbound Right, PM Peak Hour
  - Westbound Left, AM and PM Peak Hour
  - Northbound Left, PM Peak Hour
  - Southbound Left, AM Peak Hour
- Intersection 2: N Beauregard Street and Fillmore Avenue
  - Eastbound Left, AM and Sunday Peak Hour
  - Westbound Left, AM and PM Peak Hour
  - Southbound Left/Thru, AM and PM Peak Hour
  - Southbound Right, PM Peak Hour
- Intersection 3: N Beauregard Street and Braddock Road
  - Eastbound Left, AM, PM, and Sunday Peak Hour
  - Westbound Left, AM Peak Hour
  - Northbound Left, AM and PM Peak Hour
  - Northbound Left/Thru, AM and PM Peak Hour

- Northbound Right, AM and PM Peak Hour
- Southbound Left, AM and PM Peak Hour
- Southbound Thru/Right, AM and PM Peak Hour

Table 4: Future (2021) without Development Capacity Analysis Results

Intersection (Movement)	Storage Length	Future Without Development (2021)											
		AM Peak				PM Peak				Sunday Peak			
		LOS	Delay	Queue 50th	Queue 95th	LOS	Delay	Queue 50th	Queue 95th	LOS	Delay	Queue 50th	Queue 95th
1 N Beauregard Street and Seminary Road													
Overall Intersection (Signalized)		**D**	**44.0**			**D**	**45.3**			**C**	**27.3**		
Eastbound Left	650	E	59.0	230	294	E	65.1	216	#281	D	42.0	100	140
Eastbound Thru	650	D	48.9	273	330	D	45.8	180	235	D	36.7	66	95
Eastbound Right	550	D	48.5	68	213	E	77.5	334	#580	D	38.7	0	0
Westbound Left	150	F	89.4	145	#273	E	66.4	214	#357	D	49.3	64	122
Westbound Thru/Right	1200	D	54.3	134	185	D	46.9	266	321	D	41.2	74	69
Northbound Left	400	D	48.5	217	267	E	71.9	163	#227	D	42.3	50	76
Northbound Thru	600	C	26.4	385	485	D	37.6	539	633	B	18.1	177	267
Northbound Right	275	B	19.4	7	53	C	24.9	36	92	B	14.6	0	17
Southbound Left	100	E	60.8	51	98	D	54.4	73	m109	D	45.2	39	78
Southbound Thru	550	D	41.5	284	346	C	20.5	280	141	B	19.1	115	160
Southbound Right	250	D	38.8	0	70	C	29.8	323	203	C	20.9	0	53
2 N Beauregard Street and Fillmore Avenue													
Overall Intersection (Signalized)		**B**	**16.9**			**C**	**21.0**			**B**	**12.4**		
Eastbound Left	160	E	60.1	48	m64	D	43.8	37	127	E	61.7	16	40
Eastbound Thru/Right	775	A	4.7	11	370	A	7.3	160	244	A	3.7	3	140
Westbound Left	80	E	57.4	7	m24	E	76.7	26	60	D	50.3	7	27
Westbound Thru/Right	1050	A	8.5	74	98	A	8.1	93	109	A	1.9	5	42
Northbound Left/Thru	110	D	53.0	26	51	D	52.2	25	49	D	45.4	24	41
Northbound Right	50	D	51.8	0	0	D	51.0	0	0	D	44.0	0	0
Southbound Left/Thru	300	E	71.1	93	m133	E	72.3	113	m165	D	46.9	22	m40
Southbound Right	50	D	52.0	0	m2	E	77.4	14	m65	D	44.0	0	m0
3 N Beauregard Street and Braddock Road													
Overall Intersection (Signalized)		**D**	**36.0**			**C**	**34.5**			**C**	**26.8**		
Eastbound Left	75	E	69.2	167	269	E	77.9	60	111	E	76.2	15	43
Eastbound Thru	1100	B	13.9	156	#554	C	26.6	178	115	A	6.4	18	34
Eastbound Right	75	A	6.9	7	47	B	18.1	20	18	B	17.0	0	0
Westbound Left	90	E	55.2	138	214	C	34.4	371	#734	D	42.2	116	#268
Westbound Thru/Right	725	C	22.0	113	220	B	14.3	149	329	A	8.3	8	92
Northbound Left	200	E	60.1	100	151	E	61.9	91	139	D	45.1	29	54
Northbound Left/Thru	650	E	58.7	104	134	E	59.1	80	106	D	43.8	15	28
Northbound Right	50	E	59.3	38	167	E	57.1	0	81	D	44.4	0	62
Southbound Left	100	E	59.2	26	51	E	61.0	51	57	D	49.0	4	14
Southbound Thru/Right	250	E	60.5	44	74	E	60.6	50	76	D	48.7	2	10
4 Fillmore Avenue and Seminary Road													
Overall Intersection (Unsignalized)		**A**	**1.9**			**A**	**4.0**			**A**	**0.8**		
Westbound Left/Right	--	D	32.6	-	25	C	17.2	-	15	B	13.7	-	8
Northbound Thru/Right	425	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru	100	B	13.9	-	10	B	13.9	-	8	B	11.7	-	5
Southbound Thru	100	A	2.3	-	0	A	6.6	-	0	A	0.8	-	0

Intersection (Movement)	Storage Length	Future Without Development (2021)											
		AM Peak				PM Peak				Sunday Peak			
		LOS	Delay	Queue 50th	95th	LOS	Delay	Queue 50th	95th	LOS	Delay	Queue 50th	95th
5 Fillmore Avenue and Newport Village													
Overall Intersection (Unsignalized)		**A**	**3.3**			**A**	**2.9**			**A**	**2.6**		
Westbound Left/Right	250	A	8.8	-	3	A	8.7	-	3	A	8.9	-	3
Northbound Thru/Right	75	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru	125	A	7.4	-	0	A	7.4	-	3	A	7.3	-	0
6 Fillmore Avenue/Private Drive and Site Driveway/Goodwin House													
Overall Intersection (Unsignalized)		**A**	**0.3**	-		**A**	**1.1**			**A**	**1.8**		
Eastbound Left/Thru/Right	50	A	8.6	-	0	A	9.1	-	0	A	9.0	-	3
Westbound Left/Thru/Right	50	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Northbound Left/Thru/Right	75	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru/Right	75	A	7.8	-	0	A	7.3	-	0	A	7.3	-	0
7 Private Drive/Goodwin House Center Driveway													
Overall Intersection (Unsignalized)		**A**	**0.0**	-		**A**	**0.0**			**A**	**0.0**		
Westbound Left/Right	50	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Northbound Thru/Right	215	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru	75	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
8 Private Drive/Ex. Church Parking/Goodwin House Access/Garage													
Overall Intersection (Unsignalized)		**A**	**7.2**			**A**	**7.0**			**A**	**7.1**		
Eastbound Left/Thru/Right	25	A	6.9	-	0	A	7.0	-	0	A	7.3	-	0
Westbound Left/Thru/Right	125	A	7.0	-	3	A	6.5	-	0	A	6.6	-	0
Northbound Left/Thru/Right*	--	A	7.0	-	0	A	7.1	-	3	A	7.0	-	0
Southbound Left/Thru/Right	215	A	7.3	-	3	A	7.2	-	3	A	7.3	-	5

m - Volume for 95th percentile queue is metered by upstream signal

- 95th percentile volume exceeds capacity, queue may be longer

~ - Volume exceeds capacity, queue is theoretically infinite

* - Existing five-way intersection analyzed as four-way in Synchro due to limititations of HCM capacity analysis

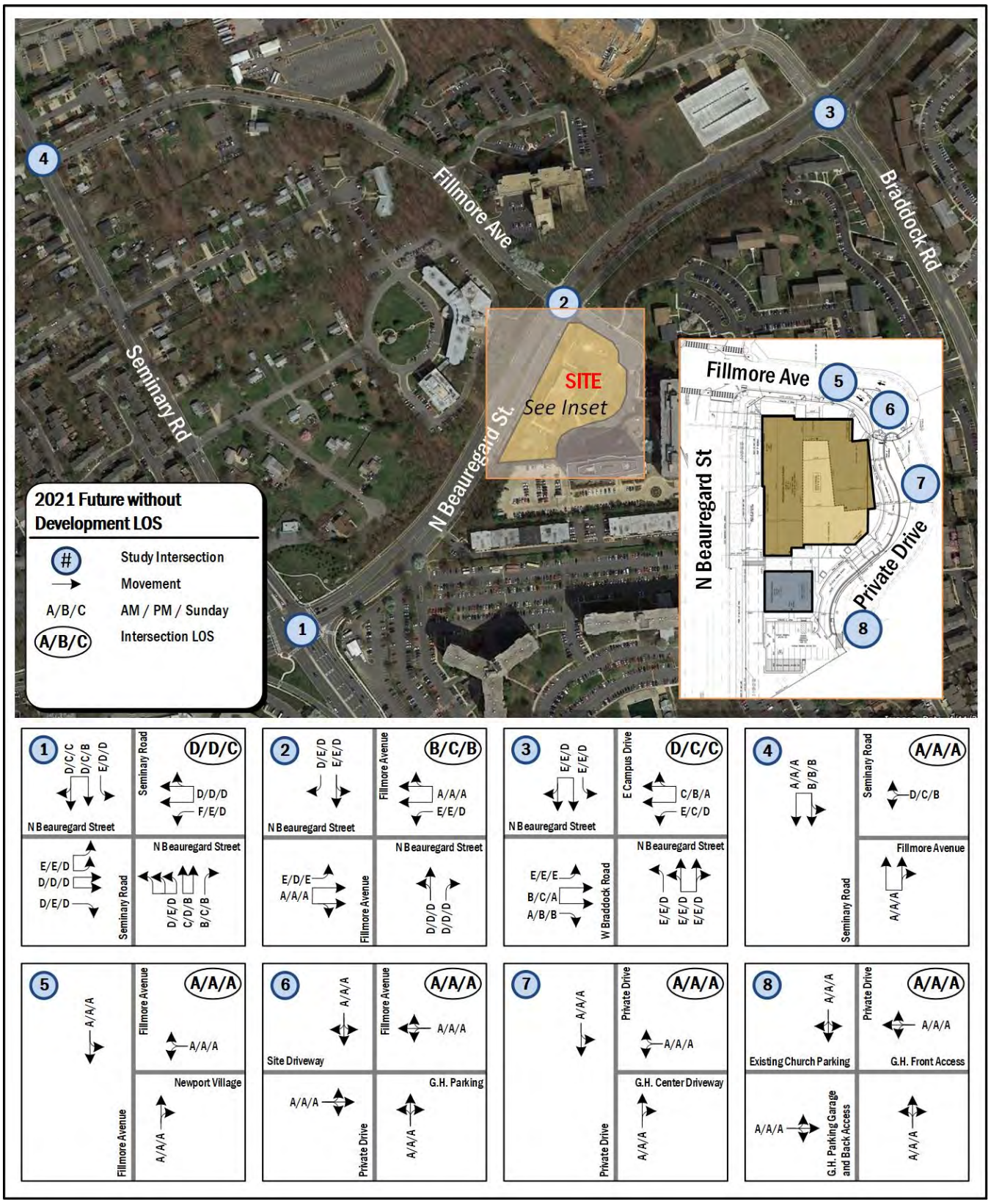

Figure 20: Future (2021) without Development Capacity Analysis Results

FUTURE (2021) WITH DEVELOPMENT CONDITIONS

The site is currently occupied by the Church of the Resurrection. Under the proposed plan, the site will include the aforementioned church along with 113 affordable residential dwelling units. A total of 112 parking spaces will be provided for the church and residences, with an 80-space enclosed garage provided for residents of the development, an expanded 25-space lot just south of the site for church uses, and seven on-street spaces, with four reserved for residential and three for church uses. The proposed build out year is 2021.

Site Access

Vehicular access will be provided via one (1) driveway located off of Fillmore Avenue. An existing curb cut will service the driveway that will provide the entrance to the proposed parking garage and surface lot for residential and church uses. A curb cut will be added north of the garage entrance on Fillmore Avenue to service trash and loading facilities. The existing lot serving the church will no longer be accessible from the private drive to Goodwin House, with the exception of emergency vehicles. The proposed site plan is presented on Figure 2 and the lane configuration for the site intersections is presented on Figure 21.

Site Generated Volumes

The Institute of Transportation Engineer's (ITE) Trip Generation, 9th Edition, was used to determine the future trips generated by the proposed residential use. Since the church currently exists at the site, the trips generated by the existing church were assumed to remain the same for the future use as well. At the time that the existing site trips were collected, the church shared the site with a daycare facility which has since relocated. Since it was not possible to differentiate the trips made for church and daycare use, all existing site trips were assumed to remain as is for the future church use with no reduction for the previous daycare use, which will provide a conservative analysis of site trips.

It is expected that a portion of the residents will travel by transit or on foot/by bicycle during the peak hours, rather than by personal vehicle; therefore, a 25% mode split reduction was applied to the peak hour vehicular trip generation to reflect the non-auto modes for the proposed residential development consistent with other projects in the area. A 25% mode spilt reduction was also applied to the trip generation based on the City of Alexandria parking code allowing for 0.75 spaces per unit for affordable housing units.

Table 5: Trip Generation

	ITE Land Use Code			AM Peak Hour			PM Peak Hour			Sunday Peak Hour			Weekday
Existing Building / Proposed Use	*Trip Generation, 9th Ed.*		**Quantity**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	**Daily**
Existing Buildings to Be Removed													
Church	--	--	Site Trips	7	3	10	3	10	13	7	26	33	130
			Existing Site Trips	**7**	**3**	**10**	**3**	**10**	**13**	**7**	**26**	**33**	**130**
Proposed Development													
Church	--	--	Site Trips	7	3	10	3	10	13	7	26	33	130
Residential	220 Apartment	113	Affordable Units	12	47	59	52	28	80	29	29	58	808
	*Affordable Housing Reduction**	*25%*		(3)	(12)	(15)	(13)	(7)	(20)	(7)	(8)	(15)	(202)
	*Residential Mode Split***	*25%*		(2)	(9)	(11)	(10)	(5)	(15)	(6)	(5)	(11)	(152)
			Proposed Development Site Trips	**14**	**29**	**43**	**32**	**26**	**58**	**23**	**42**	**65**	**584**
			Net New Site Trips (Proposed minus Existing)	**7**	**26**	**33**	**29**	**16**	**45**	**16**	**16**	**32**	**454**

* Alexandria Parking code allows for a 0.75 space/unit

** Residential mode split reduction applied to trip generation plus affordable housing reduction.

*** Existing Weekday Daily trips calculated using 10 times the value of the PM Peak Hour.

Table 5 shows that the proposed development is projected to generate 33 new trips in the weekday AM peak hour, 45 new trips in the weekday PM peak hour, and 32 new trips in the Sunday peak hour.

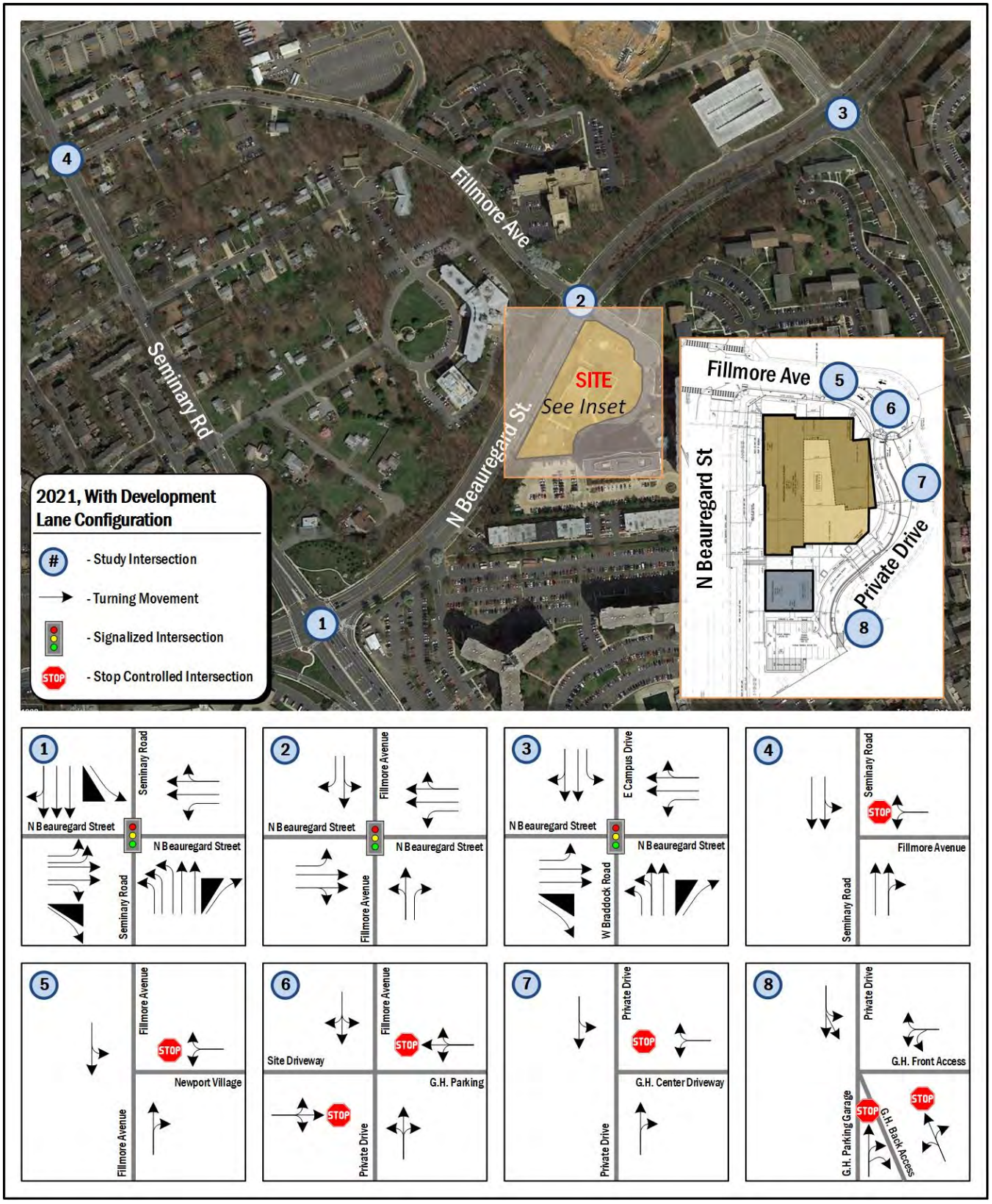

Figure 21: Future (2021) Lanes and Traffic Control Devices

Site Trip Distribution

The distribution of site trips was based primarily on existing volumes, anticipated traffic patterns, and other recent studies conducted in the area. The peak hour trips were calculated and assigned to the roadway network based on the traffic distribution shown on Figure 22. The trips generated by the site are shown on Figure 23.

Future (2021) with Development Traffic Volumes

In order to determine the traffic volumes on the roadways in the study area under the 2021 build out condition, the site generated traffic volumes were added to the Future (2021) without Development traffic volumes. The traffic volumes for the Future (2021) with Development scenario are shown on Figure 24. Church traffic utilizing the existing surface lot (at Intersection 8) will instead be rerouted to enter the site driveway (at Intersection 6) as access from the private drive to the surface lot will be closed.

Figure 22: Direction of Approach

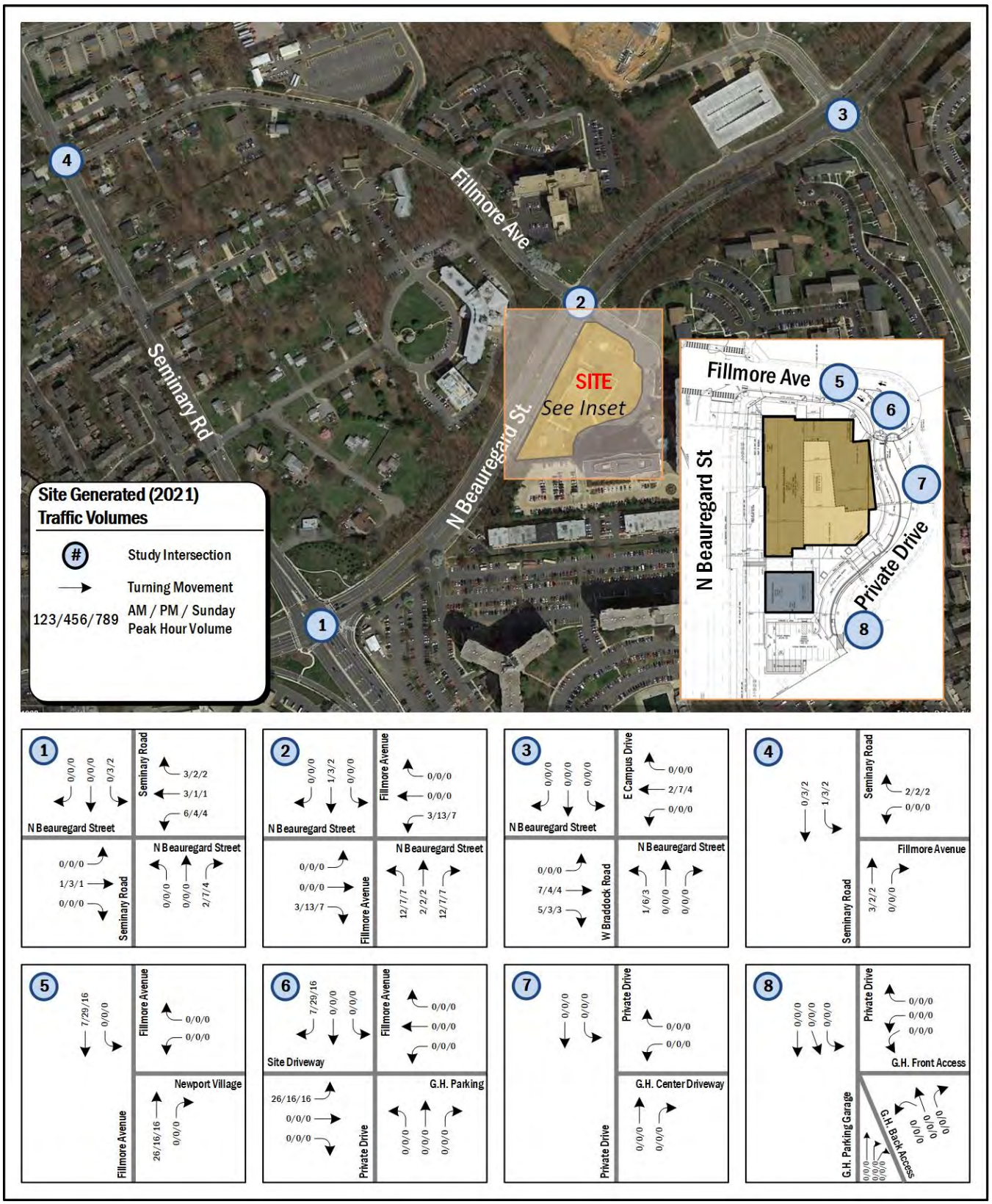

Figure 23: Site Generated Traffic Volumes

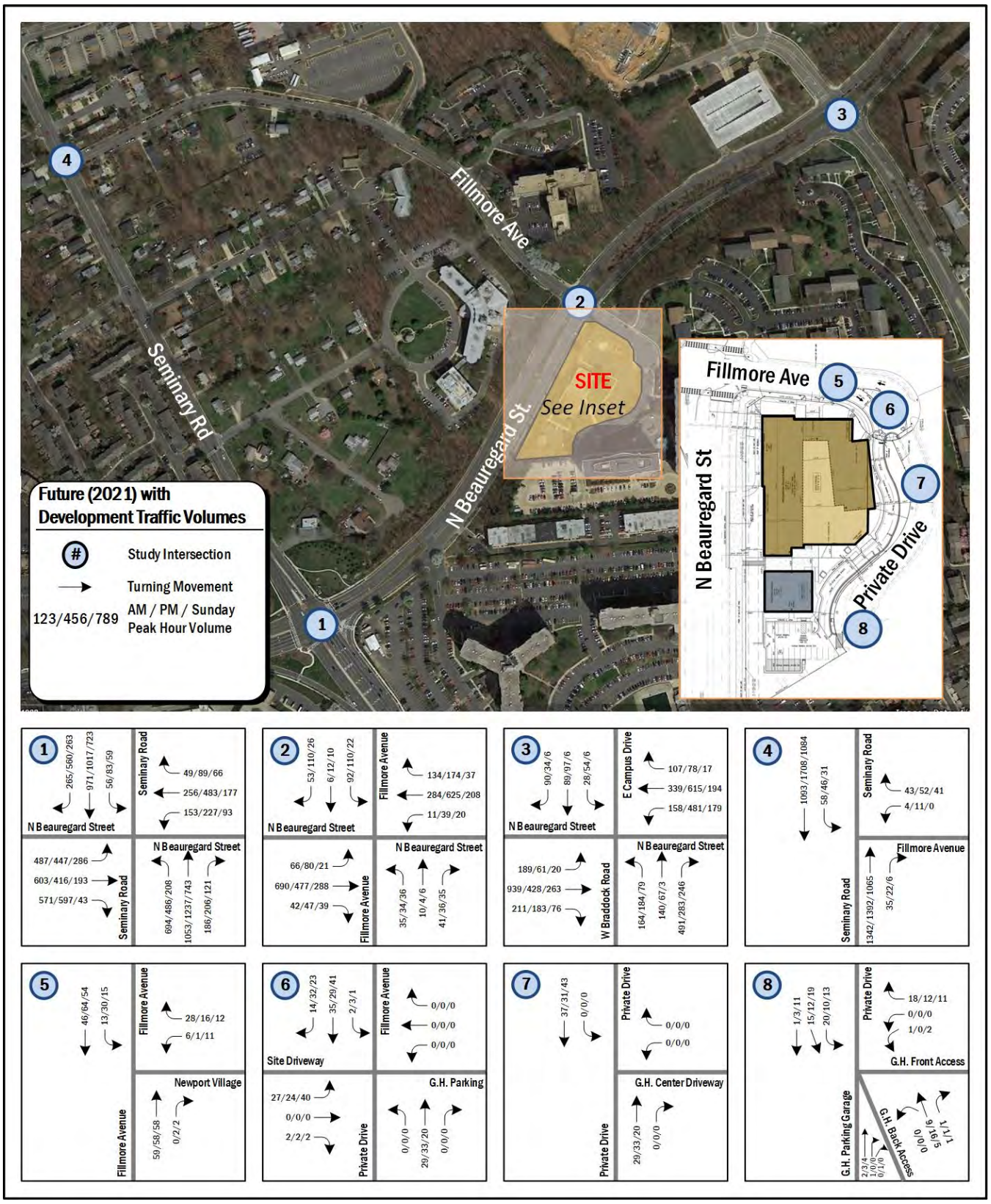

Figure 24: Future (2021) with Development Traffic Volumes

Future (2021) with Development Capacity Analysis

Capacity analyses were performed at the intersections contained within the study area during the weekday morning, weekday afternoon, and Sunday peak hours, under the future with development conditions. *Synchro, Version 9.1* was used to analyze the study intersections based on the Highway Capacity Manual (HCM) methodology and include level of service, delay, and queue length comparisons for the turning movements analyzed. Signalized intersections were analyzed using HCM 2000 methodology with unsignalized intersections using HCM 2010 methodology. Reporting methodology for this scenario is consistent with the existing and future background conditions analysis.

Peak hour factors were applied in accordance with *Transportation Planning Administrative Guidelines* prepared by the City of Alexandria dated March 25, 2013. The guidelines state that "future PHFs should be 15 percent greater than the existing for the future horizon analysis, not to exceed 0.95." As such, a PHF of 0.95 was used for all approaches at each study intersection, as the minimum existing PHF factor used was 0.85.

The results of the intersection capacity analyses are presented in Table 6 and are expressed in level of service (LOS) and delay (seconds per vehicle) per lane group. The 95% and 50% queue results for each intersection are also presented in Table 6.

The results of the intersection capacity analyses are shown on Figure 25, and the detailed analysis worksheets are contained in the Technical Appendix.

All movements at the study intersections continue to operate at levels of service consistent or better with those in the Future (2021) without Development scenario. For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of "D" or better for each lane group to an intersection. The following movements did not achieve an LOS of "D" or better:

- Intersection 1: N Beauregard Street and Seminary Road
  - Eastbound Left, AM and PM Peak Hour
  - Eastbound Right, PM Peak Hour
  - Westbound Left, AM and PM Peak Hour
  - Northbound Left, PM Peak Hour
  - Southbound Left, AM Peak Hour
- Intersection 2: N Beauregard Street and Fillmore Avenue
  - Eastbound Left, AM and Sunday Peak Hour
  - Westbound Left, AM and PM Peak Hour
  - Southbound Left/Thru, AM and PM Peak Hour
  - Southbound Right, PM Peak Hour
- Intersection 3: N Beauregard Street and Braddock Road
  - Eastbound Left, AM, PM, and Sunday Peak Hour
  - Westbound Left, AM Peak Hour
  - Northbound Left, AM and PM Peak Hour
  - Northbound Left/Thru, AM and PM Peak Hour

- Northbound Right, AM and PM Peak Hour
- Southbound Left, AM and PM Peak Hour
- Southbound Thru/Right, AM and PM Peak Hour

Table 6: Future with Development (2021) Capacity Analysis Results

Intersection (Movement)	Storage Length	Future With Development (2021)											
		AM Peak				PM Peak				Sunday Peak			
		LOS	Delay	Queue 50th	Queue 95th	LOS	Delay	Queue 50th	Queue 95th	LOS	Delay	Queue 50th	Queue 95th
1 N Beauregard Street and Seminary Road													
Overall Intersection (Signalized)		**D**	**44.2**			**D**	**45.5**			**C**	**27.2**		
Eastbound Left	650	E	59.0	230	294	E	65.1	216	#281	D	42.0	100	140
Eastbound Thru	650	D	48.9	273	330	D	45.8	181	237	D	39.0	66	95
Eastbound Right	550	D	48.0	58	197	E	78.0	336	#583	D	40.9	0	0
Westbound Left	150	F	99.0	151	#285	E	68.4	220	#362	D	48.0	67	127
Westbound Thru/Right	1200	D	52.3	134	183	D	46.3	264	320	D	43.4	75	70
Northbound Left	400	D	47.3	215	264	E	71.9	163	#227	D	42.3	50	76
Northbound Thru	600	C	26.5	385	485	D	37.9	539	633	B	17.4	177	268
Northbound Right	275	B	19.5	8	55	C	25.1	38	95	B	14.1	0	19
Southbound Left	100	E	60.8	51	98	D	54.4	75	m113	D	45.2	40	79
Southbound Thru	550	D	42.6	288	350	C	20.5	280	142	B	18.3	115	161
Southbound Right	250	D	39.6	0	71	C	30.4	324	218	C	20.1	0	53
2 N Beauregard Street and Fillmore Avenue													
Overall Intersection (Signalized)		**B**	**18.2**			**C**	**22.1**			**B**	**13.5**		
Eastbound Left	160	E	59.6	47	m64	D	44.1	38	128	E	62.1	16	40
Eastbound Thru/Right	775	A	5.8	12	375	A	8.6	165	258	A	3.9	3	145
Westbound Left	80	E	57.5	10	30	E	75.6	39	79	D	49.4	11	34
Westbound Thru/Right	1050	A	8.6	75	98	A	8.3	94	111	A	1.9	5	42
Northbound Left/Thru	110	D	53.7	40	70	D	52.6	33	62	D	45.5	30	48
Northbound Right	50	D	51.7	0	0	D	50.8	0	7	D	43.8	0	0
Southbound Left/Thru	300	E	71.2	94	m135	E	72.8	116	m171	D	46.8	24	43
Southbound Right	50	D	51.8	0	m2	E	75.3	17	m69	D	43.8	0	m0
3 N Beauregard Street and Braddock Road													
Overall Intersection (Signalized)		**D**	**35.8**			**C**	**34.2**			**C**	**26.6**		
Eastbound Left	75	E	68.7	168	270	E	76.3	59	112	E	75.3	15	43
Eastbound Thru	1100	B	13.6	158	#561	C	26.3	180	102	A	6.4	19	37
Eastbound Right	75	A	7.1	8	48	B	16.1	11	20	B	17.1	0	1
Westbound Left	90	E	55.2	138	214	C	34.3	371	#734	D	42.2	116	#268
Westbound Thru/Right	725	C	22.1	114	222	B	14.5	153	334	A	8.3	8	93
Northbound Left	200	E	60.4	101	152	E	62.2	95	143	D	45.0	30	54
Northbound Left/Thru	650	E	58.7	104	134	E	58.8	81	107	D	43.8	16	28
Northbound Right	50	E	59.3	38	167	E	56.8	0	81	D	44.3	0	62
Southbound Left	100	E	59.2	26	51	E	61.0	51	87	D	49.0	4	14
Southbound Thru/Right	250	E	60.5	44	74	E	60.6	50	76	D	48.7	2	10
4 Fillmore Avenue and Seminary Road													
Overall Intersection (Unsignalized)		**A**	**1.9**			**A**	**4.0**			**A**	**0.9**		
Westbound Left/Right	--	D	33.0	-	28	C	17.4	-	18	B	13.7	-	8
Northbound Thru/Right	425	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru	100	B	14.0	-	13	B	14.0	-	10	B	11.8	-	5
Southbound Thru	100	A	2.3	-	0	A	0.0	-	0	A	0.9	-	0

Intersection (Movement)	Storage Length	Future With Development (2021)											
		AM Peak				PM Peak				Sunday Peak			
		LOS	Delay	Queue 50th	95th	LOS	Delay	Queue 50th	95th	LOS	Delay	Queue 50th	95th
5 Fillmore Avenue and Newport Village													
Overall Intersection (Unsignalized)		**A**	**2.6**			**A**	**2.2**			**A**	**2.1**		
Westbound Left/Right	250	A	8.9	-	3	A	8.8	-	3	A	9.1	-	3
Northbound Thru/Right	75	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru	125	A	7.4	-	0	A	7.4	-	3	A	7.4	-	0
6 Fillmore Avenue/Private Drive and Site Driveway/Goodwin House													
Overall Intersection (Unsignalized)		**A**	**2.6**			**A**	**2.1**			**A**	**3.1**		
Eastbound Left/Thru/Right	50	A	9.2	-	3	A	9.3	-	3	A	9.1	-	5
Westbound Left/Thru/Right	50	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Northbound Left/Thru/Right	75	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru/Right	75	A	7.8	-	0	A	7.3	-	0	A	7.3	-	0
7 Private Drive and Goodwin House Center Dwy													
Overall Intersection (Unsignalized)		**A**	**0.0**			**A**	**0.0**			**A**	**0.0**		
Westbound Left/Thru/Right	50	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Northbound Left/Thru/Right	215	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
Southbound Left/Thru/Right	75	A	0.0	-	0	A	0.0	-	0	A	0.0	-	0
8 Private Drive/Goodwin House Access/Garage													
Overall Intersection (Unsignalized)		**A**	**7.2**			**A**	**6.9**			**A**	**7.0**		
Eastbound Left/Thru/Right	25	A	7.2	-	0	A	7.1	-	0	A	7.3	-	0
Westbound Left/Thru/Right	175	A	7.0	-	3	A	6.5	-	0	A	6.6	-	0
Northbound Left/Thru/Right	--	A	7.0	-	0	A	7.0	-	3	A	6.9	-	0
Southbound Left/Thru/Right	215	A	7.3	-	3	A	7.1	-	3	A	7.1	-	5

m - Volume for 95th percentile queue is metered by upstream signal

- 95th percentile volume exceeds capacity, queue may be longer

~ - Volume exceeds capacity, queue is theoretically infinite

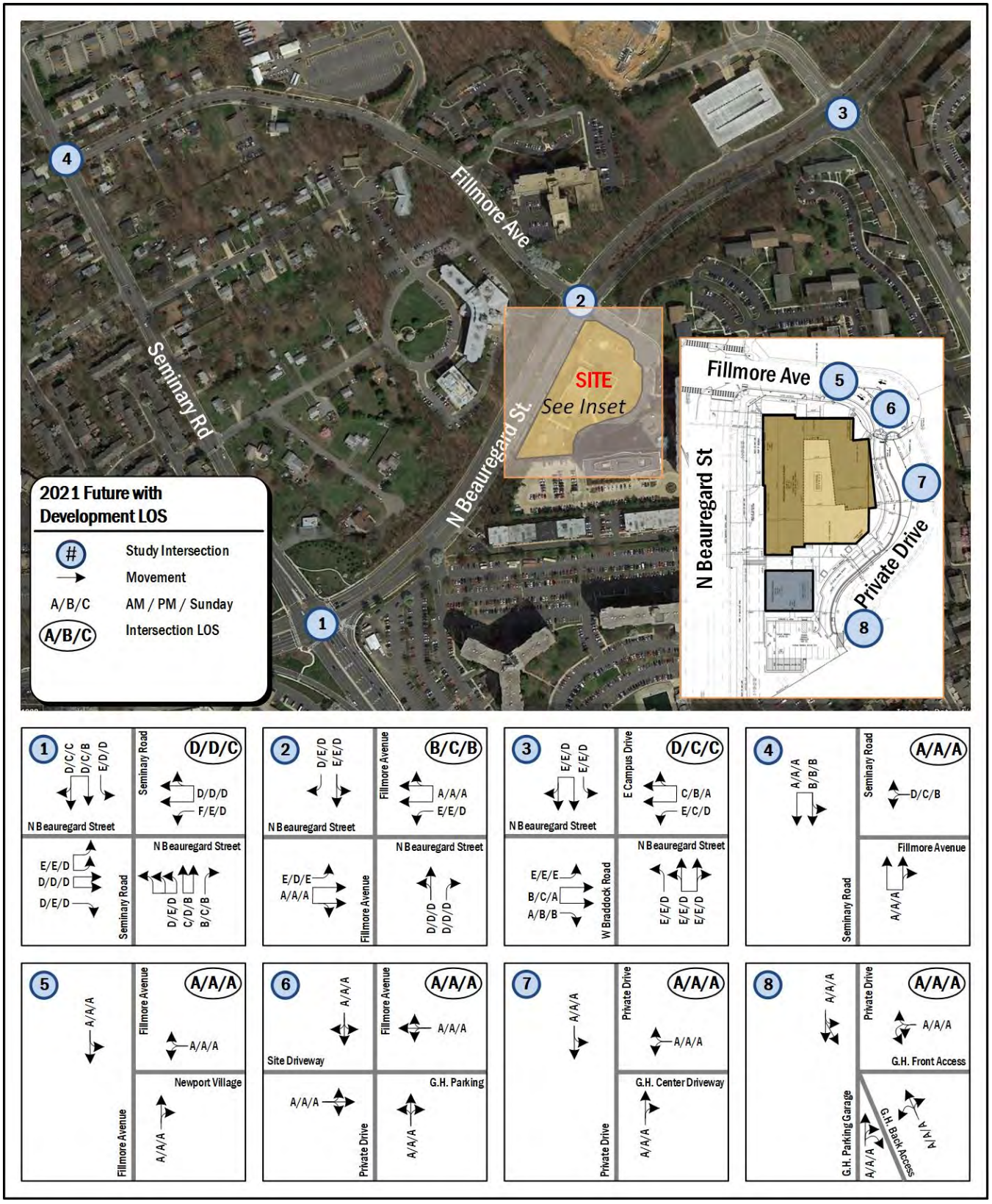

Figure 25: Future (2021) with Development Capacity Analysis Results

TRANSPORTATION MANAGEMENT PLAN FRAMEWORK

When determining the type of Transportation Management Plan (TMP) that will be required by the City of Alexandria, the Zoning Ordinance states that for "a development or building that includes more than one use, each use shall be separately assessed and the highest applicable tier shall apply to the whole development." The proposed development triggers the need for a Tier 2 Transportation Management Plan for uses include residential development of 100-349 residential dwelling units.

According to the City's Zoning Ordinance, a Tier 2 TMP requires that the developer

> *"shall have the option, with the consent of the Director of Transportation and Environmental Services and approval of this Special Use Permit, of participating in the Citywide TMP program or operating its own stand-alone TMP and may be encouraged to partner with a neighboring use."*

A Transportation Management Plan (TMP) has many components that are tailored to accommodate a given facility with the goal being the reduction of automobile trips by encouraging alternative forms of transportation. A few of the typical TMP components include the establishment of a TMP coordinator, distribution of transit literature, and designation of carpool and/or vanpool spaces. Management measures taken by this project can be monitored and adjusted as needed to continually create opportunities to reduce the amount of traffic generated by the site. A TMP for this project might include, but not be limited to, the following items:

<u>General</u>

- Designate a TMP coordinator for the site
- Provide a contribution for transit improvements:
  - Bus stop bench(es)
  - Bus stop shelter(s)
  - Bus stop ADA-compliance
- Contribute to the TMP fund based on a percentage of residents/employees non-SOV
- Conduct an annual survey with minimum response rate of 50% to be submitted to Transportation Planning Division
- Provide an annual report to Director of T&ES with occupied space, results of the annual survey and a review of the TMP program
- Create a TMP fund to achieve the TMP goals

<u>Transit Infrastructure and Subsidies</u>

- Install and maintain transit information display screens in building lobbies
- Construct and maintain a bus shelter on site to enhance transit usage
- Provide discounted transit fare media to residents and employees

<u>Bicycle Infrastructure</u>

- Install bicycle parking for residents with secure storage areas, covered parking, and accessible and visible visitor racks

Carpool, vanpool and shuttle subsidies

- Provide shuttle service from the site to a Metrorail station or bus transit center
- Implement a parking pricing strategy that encourages non-SOV travel
- Monitor and enforce the use of reserved parking spaces for carpools and vanpools
- Create and administer a ridesharing program that includes participation in the regional Commuter Connections Program and site-specific matching efforts
- Subsidize carshare vehicles for residents or employees who use alternative modes to work

Marketing and Promotions

- Promote the regional Guaranteed Ride Home Program as part of the ridesharing and transit marketing efforts
- Provide and promote on-site business center as a telework options for residents
- Distribute and display current marketing for transit schedules, rideshare applications and information, incentive information, etc.
- Promote use of transit, carpooling/vanpooling and participation in the staggered work hour program and other components of the TMP with prospective tenants during marketing/leasing/sales activities and with both prospective and existing tenants and employees of the project
- Participate in Ozone Action Days and other regionally sponsored clean air, transit, and traffic mitigation promotions by advertising such promotions in a manner and at such locations within the building acceptable to the condominium association
- Host events or participate in Bike to Work Day, Try Transit Week, Car Free Day, Earth Day or other events with Local Motion
- Any other TMP activities as may be proposed by the TMP Association and approved by the Director of T&ES as meeting goals similar to those targeted by the required TMP measures

CONCLUSIONS

This report presents the findings of a Traffic Impact Study (TIS) conducted for the proposed redevelopment of the Church of the Resurrection site in Alexandria, Virginia. The analysis presented in this report supports the following major conclusions:

- The nearest Metro station is the Van Dorn Street Metro station is located approximately 2.65 miles south of the site.
- The study area is served by both Metrobus lines and DASH lines with many bus stops located within a half mile of the site. There are two existing bus stops adjacent the site.
- The overall pedestrian network surrounding the project site is generally well established, with sidewalks on both sides of nearly all roadway segments and crosswalks at all signalized intersections and some minor street approaches.
- Off-street bicycle facilities and bike lanes are provided north of site along South Walter Reed Drive (North Beauregard Street becomes South Walter Reed Drive north of King Street). These bike facilities connect to the Washington & Old Dominion Trail and Four Mile Run northeast of the site. On-street shared lane markings are currently placed on North Beauregard Street at the Fillmore Avenue intersection, according to the Alexandria existing bicycle facilities map.
- For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of D or better for each lane group at the intersections. The capacity analysis results indicate that all intersections and movements operate at acceptable LOS under existing conditions, with the exception of the following which operate at LOS E or F:
    - Intersection 1: N Beauregard Street and Seminary Road
        - Eastbound Left, AM and PM Peak Hour
        - Eastbound Right, PM Peak Hour
        - Westbound Left, AM and PM Peak Hour
        - Westbound Thru/Right, AM Peak Hour
        - Northbound Left, PM Peak Hour
        - Southbound Left, AM Peak Hour
    - Intersection 2: N Beauregard Street and Fillmore Avenue
        - Eastbound Left, AM and Sunday Peak Hour
        - Westbound Left, PM Peak Hour
        - Northbound Left/Thru, AM Peak Hour
        - Northbound Right, AM Peak Hour
        - Southbound Left/Thru, AM and PM Peak Hour
        - Southbound Right, AM and PM Peak Hour
    - Intersection 3: N Beauregard Street and Braddock Road
        - Eastbound Left, AM, PM, and Sunday Peak Hour

        - Westbound Left, AM Peak Hour
        - Northbound Left, AM and PM Peak Hour
        - Northbound Left/Thru, AM and PM Peak Hour
        - Northbound Right, AM and PM Peak Hour
        - Southbound Left, AM and PM Peak Hour
        - Southbound Thru/Right, AM and PM Peak Hour

- The proposed development of the Church of the Resurrection site is anticipated to be completed in 2021. The future without development traffic volumes were projected by increasing the existing traffic volumes to the build-out year using an inherent growth rate of 0.5 percent per year and by adding forecasted traffic volumes for three pipeline developments in the vicinity of the site.

- Under future (2021) conditions without development, the capacity analysis results indicate that all intersections and movements operate at acceptable LOS, with the exception of the following
    - Intersection 1: N Beauregard Street and Seminary Road
        - Eastbound Left, AM and PM Peak Hour
        - Eastbound Right, PM Peak Hour
        - Westbound Left, AM and PM Peak Hour
        - Northbound Left, PM Peak Hour
        - Southbound Left, AM Peak Hour
    - Intersection 2: N Beauregard Street and Fillmore Avenue
        - Eastbound Left, AM and Sunday Peak Hour
        - Westbound Left, AM and PM Peak Hour
        - Southbound Left/Thru, AM and PM Peak Hour
        - Southbound Right, PM Peak Hour
    - Intersection 3: N Beauregard Street and Braddock Road
        - Eastbound Left, AM, PM, and Sunday Peak Hour
        - Westbound Left, AM Peak Hour
        - Northbound Left, AM and PM Peak Hour
        - Northbound Left/Thru, AM and PM Peak Hour
        - Northbound Right, AM and PM Peak Hour
        - Southbound Left, AM and PM Peak Hour
        - Southbound Thru/Right, AM and PM Peak Hour

- In order to determine future (2021) traffic volumes on the roadways in the vicinity of the site under the 2021 build out condition, the site-generated traffic volumes were added to the 2021 future background traffic volumes. The proposed development will generate a total of 33 new trips in the weekday morning peak hour, 45 new trips in the weekday afternoon peak hour, and 32 new trips in the Sunday peak hour.
- With the addition of site traffic to the road network, all movements at the study intersections continue to operate at levels of service consistent with those in the Future (2021) With Development scenario.
- Access to the Church of the Resurrection site is provided via a separate driveway parallel to the Private Drive serving the Goodwin House. The existing access to the church parking lot from the Private Drive serving the Goodwin House will be restricted to emergency vehicle access only, and future access to the church parking lot will be provided via the new site driveway. Therefore, no new site trips have been added to the Private Drive serving the Goodwin House, and there are no new impacts to queuing or delay along the Private Drive.
- A TMP will be required for this site and a TMP Framework has been included in the report.
- The study results indicate that the additional trips generated by the new apartment building and church will have a negligible impact on the operations of the study intersections. The analysis results presented in the Future (2021) With Development scenario are consistent with the results for the Future (2021) Without Development scenario, which shows conditions in 2021 without trips generated by this project.